OMB No. 2040-0042 Approval Expires 12/31/2018

United States Environmental Protection Agency
Washington, DC 20460

Completion Form For Injection Wells

Administrative Information

1. Permittee: Florence Copper Inc.

Address *(Permanent Mailing Address) (Street, City, and ZIP Code)*: 1575 W Hunt Hwy, Florence, AZ 85132

2. Operator: Florence Copper Inc.

Address *(Street, City, State and ZIP Code)*: 1575 W Hunt Hwy, Florence, AZ 85132

3. Facility Name: Florence Copper Inc.

Telephone Number: (520) 374-3984

Address *(Street, City, State and ZIP Code)*: 1575 W Hunt Hwy, Florence, AZ 85132

4. Surface Location Description of Injection Well(s)

State: Arizona

County: Pinal

Surface Location Description

SW 1/4 of SW 1/4 of NE 1/4 of SW 1/4 of Section 28 Township 4S Range 9E

Locate well in two directions from nearest lines of quarter section and drilling unit

Surface Location 1020 ft. frm (N/S) N Line of quarter section and 1040 ft. from (E/W) E Line of quarter section.

Well Activity

- [ ] Class I
- [ ] Class II
  - [ ] Brine Disposal
  - [ ] Enhanced Recovery
  - [ ] Hydrocarbon Storage
- [x] Class III
- [ ] Other

Well Status

- [x] Operating
- [ ] Modification/Conversion
- [ ] Proposed

Type of Permit

- [ ] Individual
- [x] Area : Number of Wells 33

Lease Number: NA

Well Number: R-05

Submit with this Completion Form the attachments listed in Attachments for Completion Form.

Certification

I certify under the penalty of law that I have personally examined and am familiar with the information submitted in this document and all attachments and that, based on my inquiry of those individuals immediately responsible for obtaining the information, I believe that the information is true, accurate, and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment (Ref. 40 CFR 144.32)

Name and Official Title *(Please type or print)*	Signature	Date Signed
Ian Ream, Senior Hydrogeologist		9-12-2018

PAPERWORK REDUCTION ACT

The public reporting and record keeping burden for this collection of information is estimated to average 49 hours per response for a Class I hazardous facility, and 47 hours per response for a Class I non-hazardous facility. Burden means the total time, effort, or financial resource expended by persons to generate, maintain, retain, or disclose or provide information to or for a Federal Agency. This includes the time needed to review instructions; develop, acquire, install, and utilize technology and systems for the purposes of collecting, validating, and verifying information, processing and maintaining information, and disclosing and providing information; adjust the existing ways to comply with any previously applicable instructions and requirements; train personnel to be able to respond to the collection of information; search data sources; complete and review the collection of information; and, transmit or otherwise disclose the information. An agency may not conduct or sponsor, and a person is not required to respond to, a collection of information unless it displays a currently valid OMB control number. Send comments on the Agency's need for this information, the accuracy of the provided burden estimates, and any suggested methods for minimizing respondent burden, including the use of automated collection techniques to Director, Collection Strategies Division, U.S. Environmental Protection Agency (2822), 1200 Pennsylvania Ave., NW, Washington, D.C. 20460. Include the OMB control number in any correspondence. Do not send the completed forms to this address.

Attachments to be submitted with the Completion report:

I. Geologic Information

1. Lithology and Stratigraphy

A. Provide a geologic description of the rock units penetrated by name, age, depth, thickness, and lithology of each rock unit penetrated.

B. Provide a description of the injection unit.

(1) Name
(2) Depth (drilled)
(3) Thickness
(4) Formation fluid pressure
(5) Age of unit
(6) Porosity (avg.)
(7) Permeability
(8) Bottom hole temperature
(9) Lithology
(10) Bottom hold pressure
(11) Fracture pressure

C. Provide chemical characteristics of formation fluid (attach chemical analysis).

D. Provide a description of freshwater aquifers.

(1) Depth to base of fresh water (less than 10,000 mg/l TDS).
(2) Provide a geologic description of aquifer units with name, age, depth, thickness, lithology, and average total dissolved solids.

II. Well Design and Construction

1. Provide data on surface, intermediate, and long string casing and tubing. Data must include material, size, weight, grade, and depth set.

2. Provide data on the well cement, such as type/class, additives, amount, and method of emplacement.

3. Provide packer data on the packer (if used) such as type, name and model, setting depth, and type of annular fluid used.

4. Provide data on centralizers to include number, type and depth.

5. Provide data on bottom hole completions.

6. Provide data on well stimulation used.

III. Description of Surface Equipment

1. Provide data and a sketch of holding tanks, flow lines, filters, and injection pump.

IV. Monitoring Systems

1. Provide data on recording and nonrecording injection pressure gauges, casing-tubing annulus pressure gauges, injection rate meters, temperature meters, and other meters or gauges.

2. Provide data on constructed monitor wells such as location, depth, casing diameter, method of cementing, etc.

V. Logging and Testing Results

Provide a descriptive report interpreting the results of geophysical logs and other tests. Include a description and data on deviation checks run during drilling.

VI. Provide an as-built diagrammatic sketch of the injection well(s) showing casing, cement, tubing, packer, etc., with proper setting depths. The sketch should include well head and gauges.

VII. Provide data demonstrating mechanical integrity pursuant to 40 CFR 146.08.

VIII. Report on the compatibility of injected wastes with fluids and minerals in both the injection zone and the confining zone.

IX. Report the status of corrective action on defective wells in the area of review.

X. Include the anticipated maximum pressure and flow rate at which injection will operate.

HALEY & ALDRICH, INC.
One Arizona Center
400 E. Van Buren St., Suite 545
Phoenix, AZ 85004
602.760.2450

TECHNICAL MEMORANDUM

14 September 2018
File No. 129687-010

TO: Florence Copper Inc.
Ian Ream, Senior Hydrogeologist

FROM: Haley & Aldrich, Inc.
Lauren Candreva, R.G.

Subject: Drilling, Installation, and Integrity Testing Summary
PTF Recovery Well R-05
Florence Copper Inc., Florence, Arizona

This document summarizes the drilling, installation, and testing of Production Test Facility (PTF) recovery well R-05 for Florence Copper Inc. (Florence Copper) in Florence, Arizona, including the equipment used to perform the work, completion, and the results of well testing activities. Separate well completion reports have been created for each PTF well.

The Arizona Department of Water Resources Registry ID for well R-05 is 55-227704; the Well Registry Report is included in Appendix A. Well R-05 is located in the southwest quarter of the northeast quarter of the southwest quarter of Section 28 of Township 4 north, Range 9 East of the Gila and Salt River Baseline and Meridian (D(4-9)28CAC). Well R-05 is located within the Underground Injection Control (UIC) Permitted Area of Review (AOR) for UIC Permit R9UIC-AZ3-FY11-1 and was completed as a Class III recovery well for the PTF (Figure 1).

Florence Copper contracted Hydro Resources, Inc. (Hydro Resources) to drill, install, and test recovery well R-05 in accordance with *Well Specification: Drilling, Installation, and Testing of Class III Injection and Recovery Wells, Production Test Facility, Florence, Arizona* (Haley & Aldrich, Inc. [Haley & Aldrich], 2017). A Midway 3500 drilling rig was used for all drilling and construction activities. Haley & Aldrich provided oversight of drilling activities, geophysical logging, well installation, and testing. All reported depths are in feet below ground surface unless otherwise noted.

I. Geologic Information

1. Lithology and Stratigraphy

   A. Geology of Penetrated Units

The geology penetrated during the drilling of the Class III well R-05 is summarized in the table below and a lithologic log is included in Appendix B.

Lithologic Unit Name	Depth to Bottom of Unit (feet)	Thickness of Unit (feet)	Lithology and Age of Unit
Upper Basin Fill Unit (UBFU)	279	279	Alluvium; Quaternary to Tertiary
Middle Fine-Grained Unit (MFGU)	302	23	Alluvium; Tertiary
Lower Basin Fill Unit (LBFU)	380	78	Alluvium; Tertiary to Cretaceous
Bedrock Oxide Unit (Oxide)	Not encountered	>843	Igneous porphyry – Precambrian

   B. Description of Injection Unit

Name	Bedrock Oxide Unit
Depth Drilled	1,223 feet
Thickness	>843 feet
Formation Fluid Pressure	Atmospheric plus head of freshwater – no additional formation pressure
Age of Unit	Precambrian with intrusions of Precambrian to Tertiary rocks
Porosity[1]	Approximately 6.5 to 8%
Permeability	Hydraulic Conductivity = 0.56 feet per day
Bottom Hole Temperature	30.6 degrees Celsius
Lithology	Igneous porphyry – quartz monzonite, granodiorite with diabase and andesite dykes (detailed log included in Appendix B)
Bottom Hole Pressure	Approximately 430 pounds per square inch (PSI) (pressure exerted by the column of freshwater with no additional contribution from formation pressure)
Fracture Pressure	0.65 PSI per foot

[1] Porosity values for the bedrock oxide unit are approximate values from calculated neutron porosity values from injection well borehole surveys.

C. Chemical Characteristics of Formation Fluid

The chemical characteristics of the formation fluid in the injection zone are summarized below and are the results of the sampling of the center PTF wellfield, well R-09. The table below summarizes the primary chemical characteristics detected in a formation fluid sample collected on 23 April 2018; the complete analytical report is included in Appendix C.

Analyte	Result (mg/L)
Metals	
Aluminum	<0.08
Antimony	<0.005
Arsenic	0.0016
Barium	0.071
Beryllium	<0.0005
Cadmium	<0.00025
Calcium	140
Chromium	0.0051
Cobalt	<0.00025
Copper	0.011
Iron	<0.30
Lead	<0.0005
Magnesium	27
Manganese	0.002
Mercury	<0.001
Nickel	0.0033
Potassium	6.8
Selenium	<0.0025
Sodium	170
Thallium	<0.0005
Zinc	<0.04
Anions	
Bicarbonate	150
Chloride	310
Fluoride	<0.5
Nitrate	8.8
Sulfate	190
Field Parameters	
Total Dissolved Solids	1,000
pH	7.8
Radiochemicals	
Uranium	0.016
Notes: *mg/L = milligrams per liter*	

Sampling results for well R-05 are included in the *PTF Mine Block Ambient Groundwater Concentrations and Initial Discharge Characterization of the Underground Workings* (Brown and Caldwell, 2018).

D. Description of Freshwater Aquifers

1) The depth to the base of the freshwater aquifer is defined by the interface where deeper formation fluid exhibits a total dissolved solids (TDS) value of 10,000 milligrams per liter (mg/L). The depth of the 10,000 mg/L interface is deeper than all of the wells drilled at the site, and consequently, has not been defined.

2) The geologic description of the aquifer units is included below:

Aquifer Unit Name	Age	Depth (feet)	Thickness (feet)	Lithology	Average Total Dissolved Solids[1] (mg/L)
UBFU	Quaternary/Tertiary	0 to 279	279	Alluvium	914
LBFU	Tertiary	302 to 380	78	Alluvium	754

Notes:
[1] Average TDS values calculated from UBFU and LBFU monitoring well ambient monitoring results near the PTF.

II. Well Design and Construction

1. Well R-05 Casing Installed:

Casing	Material	Diameter (inches)	Weight (pounds per foot)	Depth (feet)	Borehole Diameter (inches)	Drilling Method
Surface	Mild Steel	24 O.D. 23¼ I.D.	94.71	0 to 40	30	Solid-stem auger
Overburden (intermediate)	Mild Steel – bottom 40 feet poly coated	14 O.D. 13⅜ I.D.	47.36	0 to 502	20	Reverse flooded rotary
Well Casing	Fiberglass Reinforced Plastic	5.47 O.D. 4.74 I.D.	5.40	-2.0 to 521	Inside overburden casing to 502 feet; 12¼	Inside overburden casing/reverse flooded rotary
Screen	PVC SCH80 with 0.080-inch wide slots	5.56 O.D. 4.81 I.D.	4.08	521 to 641 661 to 881 901 to 1,201	12¼	Reverse flooded rotary
Blank Intervals	PVC SCH80	5.56 O.D. 4.81 I.D.	14.75	641 to 661 881 to 901	12¼	Reverse flooded rotary

Notes:
I.D. = inside diameter
O.D. = outside diameter
PVC = polyvinyl chloride
SCH = Schedule

2. Well Cement

Cement Interval	Cement Type	Additives	Amount Installed (cubic yards)	Method of Emplacement
Surface Casing	Type V Neat 21 sack slurry	None	7	Submerged tremie
Overburden Casing	Type V Neat 21 sack slurry	None	26.4	Displacement - installed through drillable grout shoe with one-way stab-in valve, welded to the bottom of the casing
Well Casing	Type V Neat 21 sack slurry	None	19.0	Submerged Tremie

Field forms documenting pipe tallies, annular materials, and cement tickets are included in Appendix D.

3. Annular Packers

No annular packers were used during construction of well R-05.

4. Centralizers

Casing	Centralizer Type	Number and Spacing
Overburden	Mild Steel – welded	13 installed – every 40 feet
Well – FRP and PVC	Stainless steel – Heavy Duty	30 installed – every 40 feet
Notes: *FRP = fiberglass reinforced plastic* *PVC = polyvinyl chloride*		

5. Bottom Hole Completion

There is no bottom hole completion as this is not an oil/gas well. The well was completed at the bottom with a stainless-steel endcap of the same diameter as the well screen.

6. Well Stimulation

No well stimulation was used during the drilling and construction of well R-05.

III. Description of Surface Equipment

1. Surface Equipment

   Well R-05 is a recovery well and has been equipped with a submersible pump. The 2-inch diameter discharge pipe extends from the well head and into the manifold that conveys the fluid directly to the solvent extraction/electrowinning plant on-site. A diagram of the wellhead is included as Figure 2.

IV. Monitoring Systems

1. Well Monitoring Equipment

Equipment Type	Location	Type	Purpose
Annular Pressure Transducer	Well Annulus – 636 feet bgs	Recording	Monitor water column/pressure
Pressure Transducer	Well Casing – approx. 400 feet bgs	Recording	Monitor water column/pressure
Flow Meter	Wellhead	Recording	Monitor extraction rate
Pressure Gauge	Wellhead	Nonrecording	Monitor wellhead pressure

2. Monitoring Wells

   There are a total of 16 monitoring wells associated with the PTF: 7 point-of-compliance (POC) wells, 7 United States Environmental Protection Agency (USEPA) supplemental monitoring wells, and 2 operational monitoring wells. The POC wells are located outside the AOR and are not constructed as Class III wells. The supplemental monitoring and operational monitoring wells are located within the AOR and are constructed as Class III wells as required by the UIC Permit. The wells are summarized in the tables below by type.

POC Wells						
Well ID	**Location X/Y (State Plane NAD 83)**	**Depth (feet)**	**Well Nom. Diameter (inches)**	**Cementing Method**	**Screened Interval (feet)**	**Screened Lithologic Unit**
M14-GL	846750.23 746461.52	859	5 9/16 OD	Submerged tremie	778 to 838	LBFU
M15-GU	846697.17 746464.82	615	5 9/16 OD	Submerged tremie	554 to 594	LBFU
M22-O	846751.26 746514.47	1,140	5 9/16 OD to 528 feet; 4½ OD to 1,140 feet	Submerged tremie	932 to 1,130	Oxide

POC Wells						
Well ID	**Location X/Y (State Plane NAD 83)**	**Depth (feet)**	**Well Nom. Diameter (inches)**	**Cementing Method**	**Screened Interval (feet)**	**Screened Lithologic Unit**
M23-UBF	846688.13 746512.48	250	6 5/8 OD	Submerged tremie	210 to 250	UBFU
M52-UBF	851092.00 774178.00	274	5 9/16	Submerged tremie	198 to 273	UBFU
M54-LBF	847331.96 746682.61	630	5 9/16	Submerged tremie	310 to 629	LBFU
M54-O	847342.99 746702.36	1,199	5 9/16	Submerged tremie	668 to 1,198	Oxide
OD = outside diameter						

Supplemental Monitoring Wells						
Well ID	**Location X/Y (State Plane NAD 83)**	**Depth (feet)**	**Well Nom. Diameter (inches)**	**Cementing Method**	**Screened Interval (feet)**	**Screened Lithologic Unit**
M55-UBF	847541.46 746280.63	261	5	Submerged tremie	240 to 260	UBFU
M56-LBF	847518.70 746303.41	340	5	Submerged tremie	320 to 340	LBFU
M57-O	847378.37 746248.93	1,200	5	Submerged tremie	523 to 1,199	Oxide
M58-O	847672.23 746595.97	1,200	5	Submerged tremie	594 to 1,199	Oxide
M59-O	847934.95 746218.89	1,201	5	Submerged tremie	534 to 1,199	Oxide
M60-O	847599.37 745903.70	1,201	5	Submerged tremie	444 to 1,200	Oxide
M61-LBF	848184.46 746148.88	629	5	Submerged tremie	429 to 629	LBFU

Operational Monitoring Wells						
Well ID	**Location X/Y (State Plane NAD 83)**	**Depth (feet)**	**Well Nom. Diameter (inches)**	**Cementing Method**	**Screened Interval**	**Screened Lithologic Unit**
MW-01-LBF	847487.97 746360.54	444	5	Submerged tremie	330 to 440	LBFU
MW-01-O	847499.04 746369.31	1,200	5	Submerged tremie	500 to 1,200	Oxide

V. Logging and Testing Results

Borehole geophysical logging was conducted on well R-05 in four phases: 1) open-hole surveys in the 20-inch borehole prior to installation of the overburden casing; 2) cased-hole surveys in the 14-inch casing; 3) open-hole surveys in the 12.25-inch borehole prior to installation of the well casing and screen; and 4) cased-hole surveys in the completed well.

The open-hole geophysical surveys completed at well R-05 included:

- Spontaneous potential;
- Natural gamma;
- Electrical resistivity (short and long normal);
- Caliper with calculated volume;
- Temperature;
- Sonic; and
- Deviation.

The cased-hole geophysical surveys completed included:

- Cement bond log (overburden steel casing);
- Sonic (for cement bond with fiberglass reinforced plastic [FRP]);
- 4 Pi Density (for cement bond with FRP);
- Dual Density (for cement bond with FRP);
- Natural Gamma;
- Fluid Conductivity;
- Temperature;
- Gyroscopic Deviation Survey; and
- Video Survey.

Open-hole geophysical surveys were used to support identification of the lithologic contacts, to evaluate the condition of the borehole, and to evaluate the deviation of the borehole.

The primary logs used to evaluate lithologic contacts are natural gamma ray, short (16-inch) and long (64-inch) normal electrical resistance, and single-point resistance. The lithologic contacts for the Middle Fine-Grained Unit (MFGU) were selected based on the short and long resistance and the single-point resistance. All the resistivity logs decreased and stayed consistently low through the MFGU. This contact is generally a relatively sharp decrease in resistance at the top of the unit and a gradual increase in resistance below the bottom of the unit.

The contact between the Lower Basin Fill Unit (LBFU) and the bedrock was identified primarily with natural gamma and correlated with the resistance logs. There is generally an increase in gamma at the contact between the LBFU and the bedrock that had been identified and documented at the site during exploration in the 1990s. For well R-05, there is not a significant gamma shift at the LBFU/bedrock contact as seen at some of the other PTF wells, but there is an abrupt increase of resistivity at 380 feet similar to the increase seen at other PTF wells. To determine the contact, the sonic log was reviewed which indicates there is a sustained increase in density beginning at 380 feet, and also by inspecting the drilled cuttings to confirm that bedrock is at 380 feet.

Cased-hole geophysical surveys were conducted to evaluate the cement seal and the casing-cement bond, to document baseline fluid temperature and conductivity, and to evaluate the plumbness of the well. The cement-bond is discussed in Section VII.

Copies of all the open-hole geophysical logs and cased-hole temperature, fluid conductivity, and natural gamma are included in Appendix E; a figure summarizing the open-hole logs used to evaluate geology is included as Figure 3. The cased-hole logs used to evaluate cement bond are included in Appendix F.

VI. Well As-Built Diagram

A diagram showing the wellhead completion for well R-05 is included as Figure 2. A well as-built diagram for well R-05 is included as Figure 4.

VII. Demonstration of Mechanical Integrity

A demonstration of Part I mechanical integrity of the well was completed using a standard annular pressure test (SAPT) in accordance with Part II.E.3.a.i.A of the UIC Permit. Mechanical integrity will be demonstrated every 2 years during operations and will be confirmed by daily injection pressure monitoring that will be conducted per the UIC Permit once the well is operational. Well R-05 SAPT is summarized below.

The mechanical integrity of the blank well casing was tested by performing a SAPT on 28 February 2018. The SAPT was conducted by installing an inflatable straddle packer assembly in the well. The bottom packer was installed near the bottom of the FRP-cased portion of the well and the top packer was near the surface, the packers were inflated to form a seal against the casing. The bottom 5 feet of the packer drop pipe was perforated to allow for communication between the tubing and the annulus of the packer assembly. The drop pipe extended through the wellhead and a high pressure/low volume pump was attached to the drop pipe to pressurize the test interval. A valve on the drop pipe at the surface was used to isolate the test interval once the planned test pressure was achieved.

An In-Situ LevelTROLL® pressure transducer with a data logger was installed at the well head and was connected to the packer assembly annulus interval via a National Pipe Thread adapter. The LevelTROLL was used to monitor and record pressure inside the well during the SAPT. To conduct the SAPT, water

was pumped from a nearby well immediately prior to testing. Before the water was pumped into the test well, the water temperature was measured to ensure that it was similar to the ambient groundwater temperature of the test well to reduce the potential of differential temperature effects on the well casing. The SAPT for the Class III well was conducted by applying hydraulic pressure to well casing and shutting in pressure between the packer and wellhead assembly, monitoring the shut-in pressure for a 30-minute period, then measuring the volume of water returned from the well casing after the pressure was released.

On 28 February 2018, the packer was installed to approximately 505 feet and the SAPT was conducted successfully four times. The USEPA SAPT form, a table of the data, and a chart of the data is provided in Appendix G.

Part II mechanical integrity is demonstrated by the cementing records included in this report (in accordance with Part II.E.3.ii.C of the UIC Permit) and will be demonstrated during operations by annular conductivity monitoring on the observation and multi-level sampling wells (in accordance with Part II.E.3.a.ii.A of the UIC Permit).

Cemented Interval	Cement Type	Calculated Grout Volume (cubic yards)	Installed Grout Volume (cubic yards)
Surface Casing	Type V 21 sack neat cement slurry	2.6	7
Overburden Casing	Type V 21 sack neat cement slurry	24.0	26.4
Well Casing	Type V 21 sack neat cement slurry	16.4	19.0

On 7 December 2018, a cement bond log was run on the overburden casing. On 2 March 2018, a suite of logs was run over the entire length of the completed well to verify the grout seal; a summary of the logs completed to demonstrate cement bond are included in Appendix F.

The cement bond of the steel casing was evaluated by the geophysical contractor by calculating a bond index. The bond index was calculated to be an average of 93 percent at well R-05 over the cement grouted interval from 0 to 499 feet; this data is included on the summary log in Appendix G. A sonic log was also run in the steel casing and the sonic data indicate a consistent density in the steel cased cemented interval of well R-05, which supports the cement bond log data.

There is not a bond log tool designed to evaluate cement bond with FRP casing, so the cement interval with the FRP casing at well R-05 was evaluated using density logs. The logs conducted include sonic, focused density, and 4pi density logs. The measured density of the cased interval at well R-05 indicates there are no significant cement deficiencies from the approximately 221 feet (static water Level) to 493 feet, and no significant cement deficiencies were noted in the 4pi density data collected from 15 to 493 feet. There were some very localized, relatively low density intervals identified in the density logs but they were insignificant, only extending 2 to 3 feet. A summary of the FRP cased data is included in the well completion summary for R-05 in Appendix G.

VIII. Compatibility of Injected Waste

The Florence Copper Project is a Class III mineral extraction project and does not include the injection of any waste products of any kind. The injected fluid (lixiviant) is a carefully constituted in-situ copper recovery solution that will be recovered and recycled following injection.

The compatibility of the lixiviant was evaluated as part of the geochemical modeling completed by Florence Copper and summarized in the *Geochemical Evaluation to Forecast Composition of Process Solutions for In-Situ Copper Recovery Pilot Test Facility at Florence Copper, Florence Arizona* (Daniel B. Stephens Inc., 2014) which was included in Attachment H of the UIC Permit Application.

IX. Status of Corrective Action on Defective Wells in the Area of Review

There are not currently any defective wells in the AOR.

X. Maximum Pressures and Flow Rates for R-05

Maximum Operating Pressure	Maximum Flow (Extraction)
Atmospheric	No maximum extraction flow

This well is a recovery well used to extract solution; there is no maximum flow. However, in accordance with Section 2.2.1.1 of the Aquifer Protection Permit (APP), the recovery rate for the entire wellfield must always exceed the injection rate on a daily average, and in accordance with Part II.E.5.a of the UIC Permit the recovery rate will not fall below 110 percent of the injection rate on a daily average.

XI. Well Development

Well R-05 was developed by the airlift method, followed by pumping, and was completed by Hydro Resources using a workover rig. To purge drilling fluids and solids, the well was air-lift developed at various depths ranging from approximately 400 to 1,000 feet. During development, the airlift pump was turned on and off to surge the well. Airlift development started on 13 February 2018 and was conducted over a period of 7 days. On 16 February 2018, approximately 33 gallons of chlorine was added to the well. The discharge was relatively clear and sand-free at the end of the airlift development period.

On 22 February 2018, a submersible pump was temporarily installed to approximately 1,160 feet to pump develop the well. Prior to pumping, the static water level was measured at approximately 221 feet. Pump development was conducted at approximately 63 gallons per minute (gpm) over a period of 5 days (22 through 26 February 2018), during which time the submersible pump was

periodically turned off to surge the well. The discharge was sand-free and visually clear throughout the pump development period, with turbidity values of generally less than 10 Nephelometric Turbidity Units at the end of the development period. Well development forms are included in Appendix H.

XII. Well Completion

A well video survey was conducted on 21 March 2018; the video log report is included as Appendix I. The video log depths are presented in feet below the top of the casing and thus vary slightly from what is recorded; however, these values are the same with the correction for stick up.

The video log indicates the total depth reached was 1,191 feet; the bottom of the well was airlifted on 20 February 2018 down to 1,200 feet.

A gyroscopic survey was also conducted on the completed well on 21 March 2018; the results are included in Appendix I.

The surveyed location for well R-05 is:

Northing (feet)	Easting (feet)	Measuring Point Elevation (feet amsl)
745990.04	847694.30	1478.54
***Notes**:* *Northing and easting locations provided in State Plane North American Datum 1983, vertical location provided in North American Vertical Datum 1988.* *amsl – feet above mean sea level*		

XIII. Downhole Equipment

On 11 July 2018, the permanent pump equipment was installed in the well. The equipment installed included the following:

- Wilo 7.5 horsepower, 40-gpm pump – intake at 810 feet;
- 2-inch Schedule 120 threaded and coupled polyvinyl chloride column pipe with 316L stainless steel couplers from the pump to approximately 500 feet;
- 2-inch Schedule 40 threaded and coupled 316L stainless steel column pipe with 316L stainless steel couplers from approximately 500 feet to the wellhead;
- 316L braided stainless steel safety cable was installed from the pump to the wellhead;
- Pressure transducer; and
- 1-inch nominal diameter sounding tube.

The type and depth of equipment installed in each well is not constrained by the UIC Permit or the APP. This information is provided in accordance with Section 2.7.4.3 of the APP. Operational consideration may require that the type and depth of equipment may need to be changed in response to conditions observed during operations.

XIV. References

Brown and Caldwell, Inc., 2018. *PTF Mine Block Ambient Groundwater Concentrations and Initial Discharge Characterization of the Underground Workings*. Prepared for Florence Copper. August.

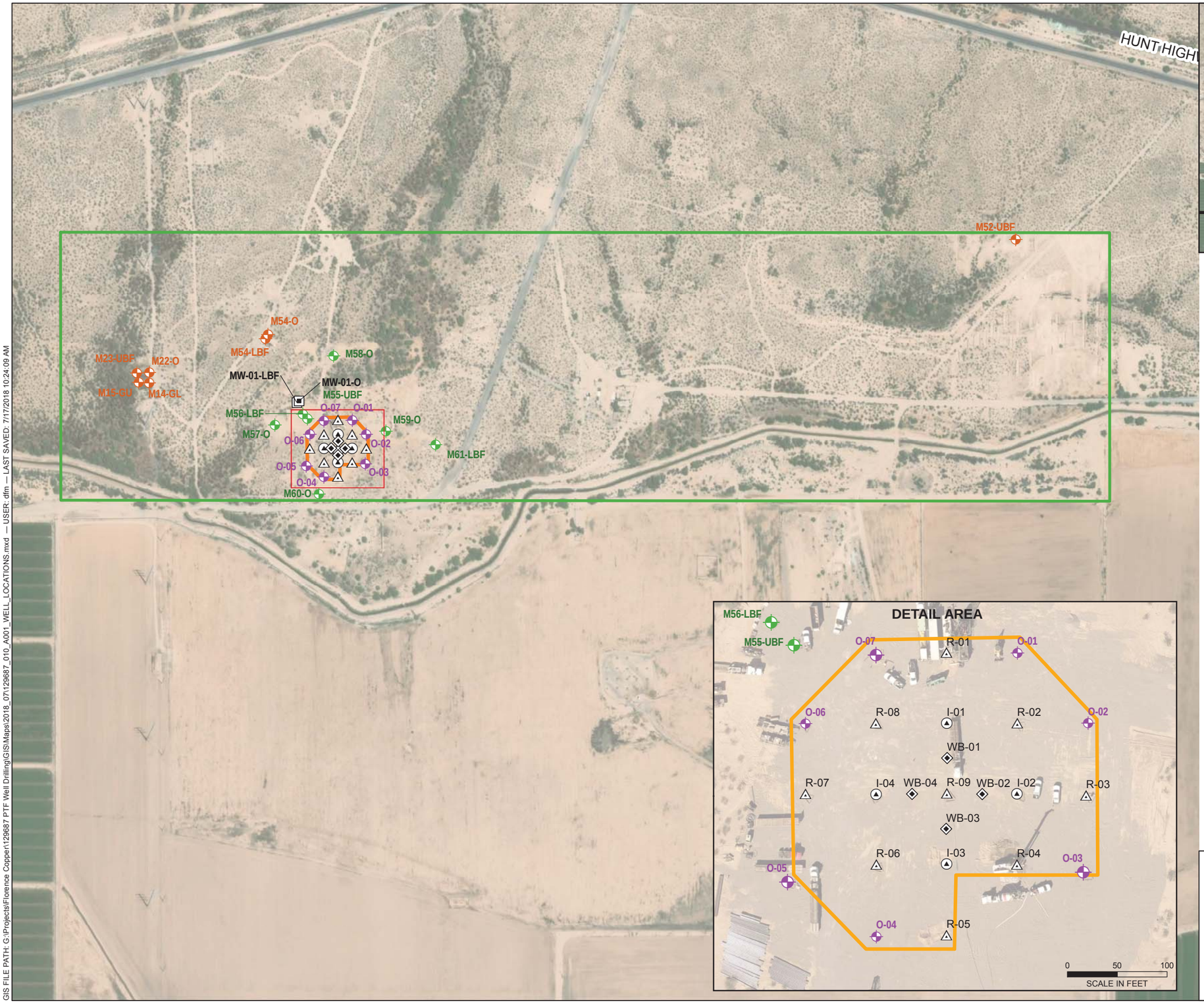
Daniel B. Stephens, Inc., 2014. *Geochemical Evaluation to Forecast Composition of Process Solutions for In-Situ Copper Recovery Pilot Test Facility at Florence Copper, Florence Arizona.* Prepared for Florence Copper. May.

Haley & Aldrich, Inc., 2017. *Well Specification: Drilling, Installation, and Testing of Class III Injection and Recovery Wells, Production Test Facility, Florence, Arizona*. Revised September 2017.

Enclosures:

- Figure 1 – Well Locations
- Figure 2 – Recover Well Head Detail
- Figure 3 – Geophysical Data and Lithologic Log
- Figure 4 – Well R-05 As-Built Diagram
- Appendix A – Arizona Department of Water Resources Well Registry Report
- Appendix B – Lithologic Log
- Appendix C – Chemical Characteristics of Formation Water
- Appendix D – Well Completion Documentation
- Appendix E –Geophysical Logs
- Appendix F – Cement Bond Log Summary
- Appendix G – SAPT Documentation
- Appendix H – Well Development Field Forms
- Appendix I – Well Video Log and Gyroscopic Survey Reports

FIGURES



0 1,250 2,500
SCALE IN FEET

LEGEND

- OBSERVATION WELL
- SUPPLEMENTAL MONITORING WELL
- POINT-OF-COMPLIANCE WELL

PTF WELL

- INJECTION
- RECOVERY
- WESTBAY WELL
- OPERATIONAL MONITORING
- PTF WELL FIELD
- STATE LAND LEASE

NOTES

1. ALL LOCATIONS AND DIMENSIONS ARE APPROXIMATE.
2. AERIAL IMAGERY SOURCE: ESRI

N

0 500 1,000
SCALE IN FEET

HALEY ALDRICH

FLORENCE COPPER PROJECT
FLORENCE, ARIZONA

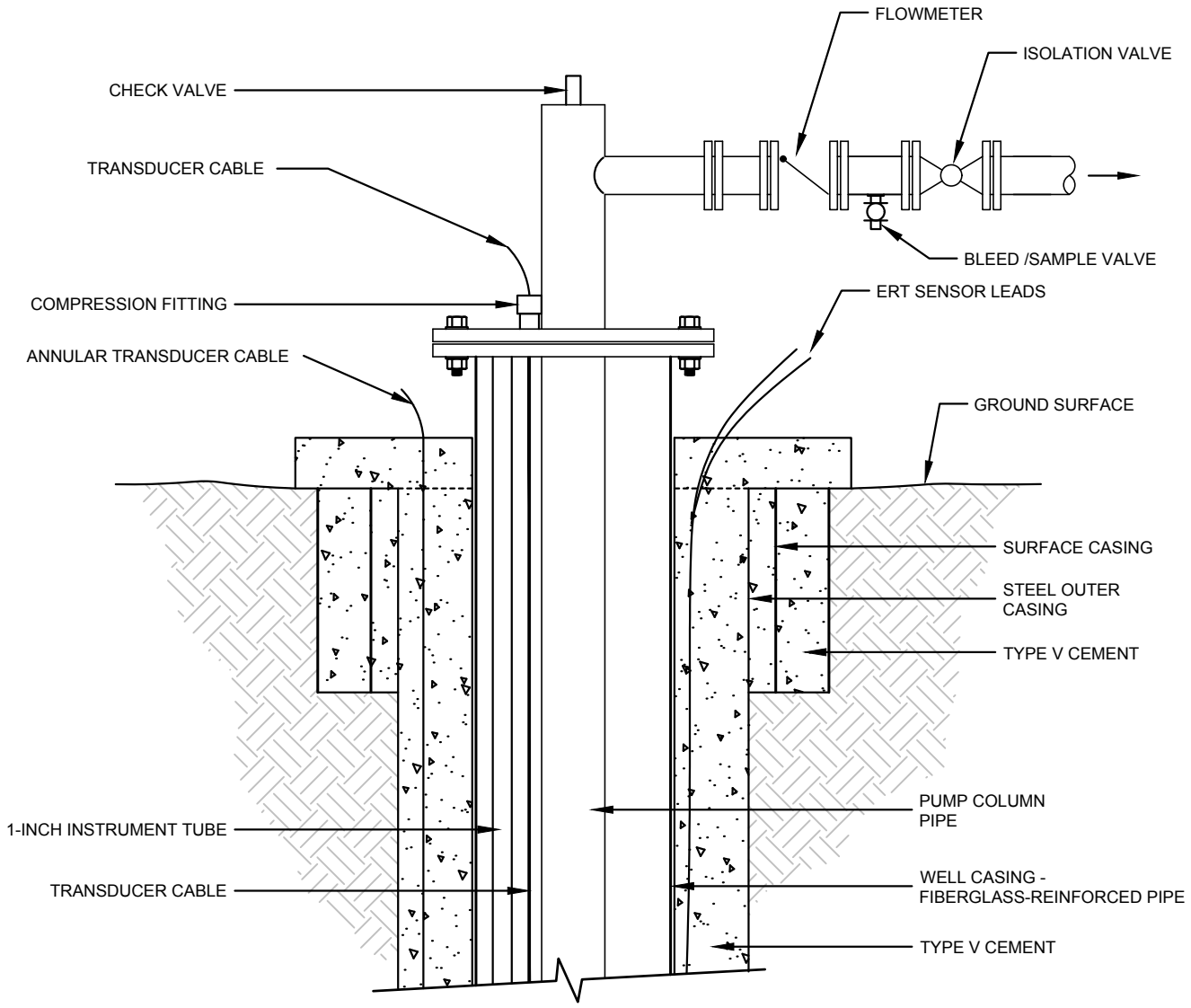
WELL LOCATIONS

FLORENCE COPPER INC.

AUGUST 2018

FIGURE 1

GIS FILE PATH: G:\Projects\Florence Copper\129687 PTF Well Drilling\GIS\Maps\2018_07\129687_010_A001_WELL_LOCATIONS.mxd — USER: dfm — LAST SAVED: 7/17/2018 10:24:09 AM



NOTES

1. ERT - ELECTRICAL RESISTIVITY TOMOGRAPHY

HALEY ALDRICH

PRODUCTION TEST FACILITY
FLORENCE COPPER, INC.
FLORENCE, ARIZONA

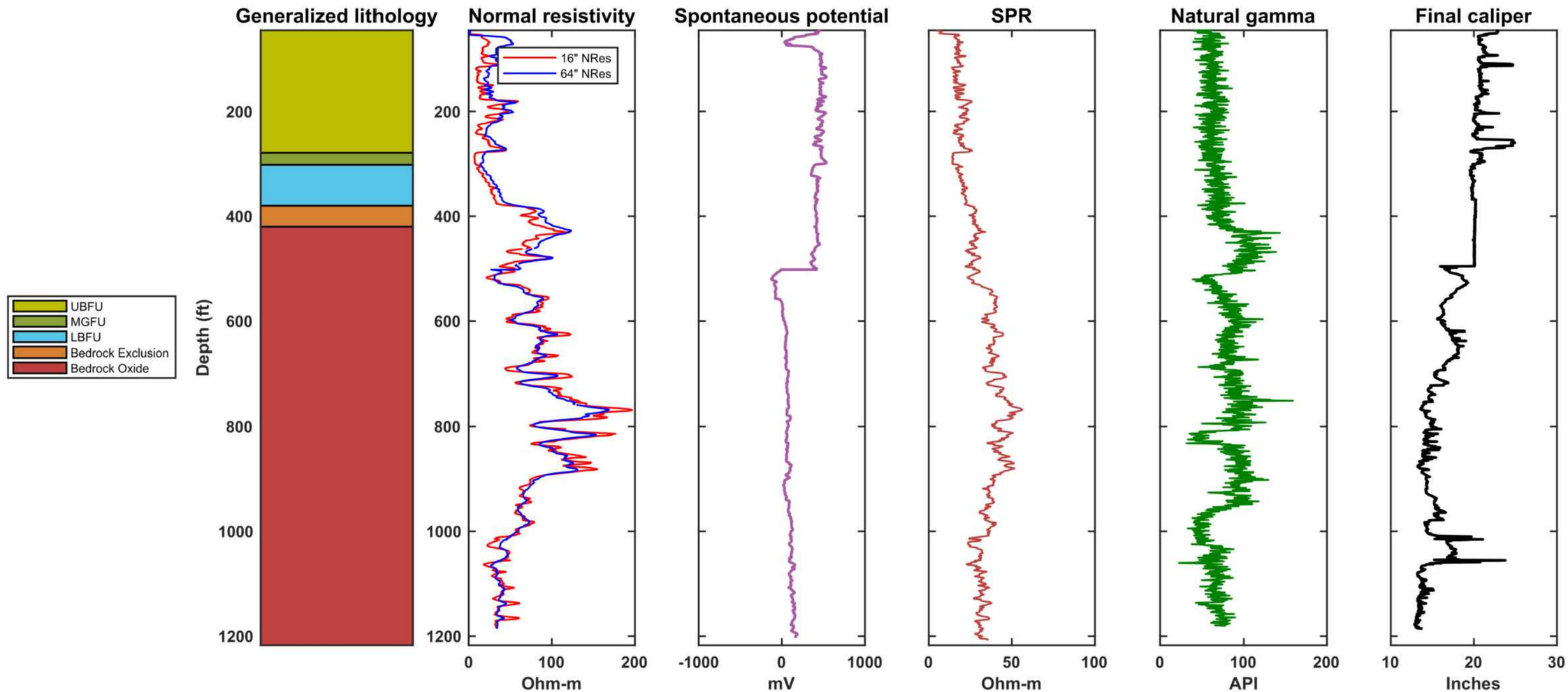
RECOVERY WELL HEAD DETAIL

FLORENCE COPPER INC.

SCALE: NOT TO SCALE
SEPTEMBER 2018

FIGURE 2

MOBINI, GITA Printed: 8/31/2018 11:24 AM Layout: DETAIL
E:\PROJECTS\FLORENCE COPPER\CAD\AS-BUILTS\RECOVERY WELLS\129687-011_RECOVERY WELL HEAD.DWG



HALEY ALDRICH

PRODUCTION TEST FACILITY
FLORENCE COPPER, INC.
FLORENCE, ARIZONA

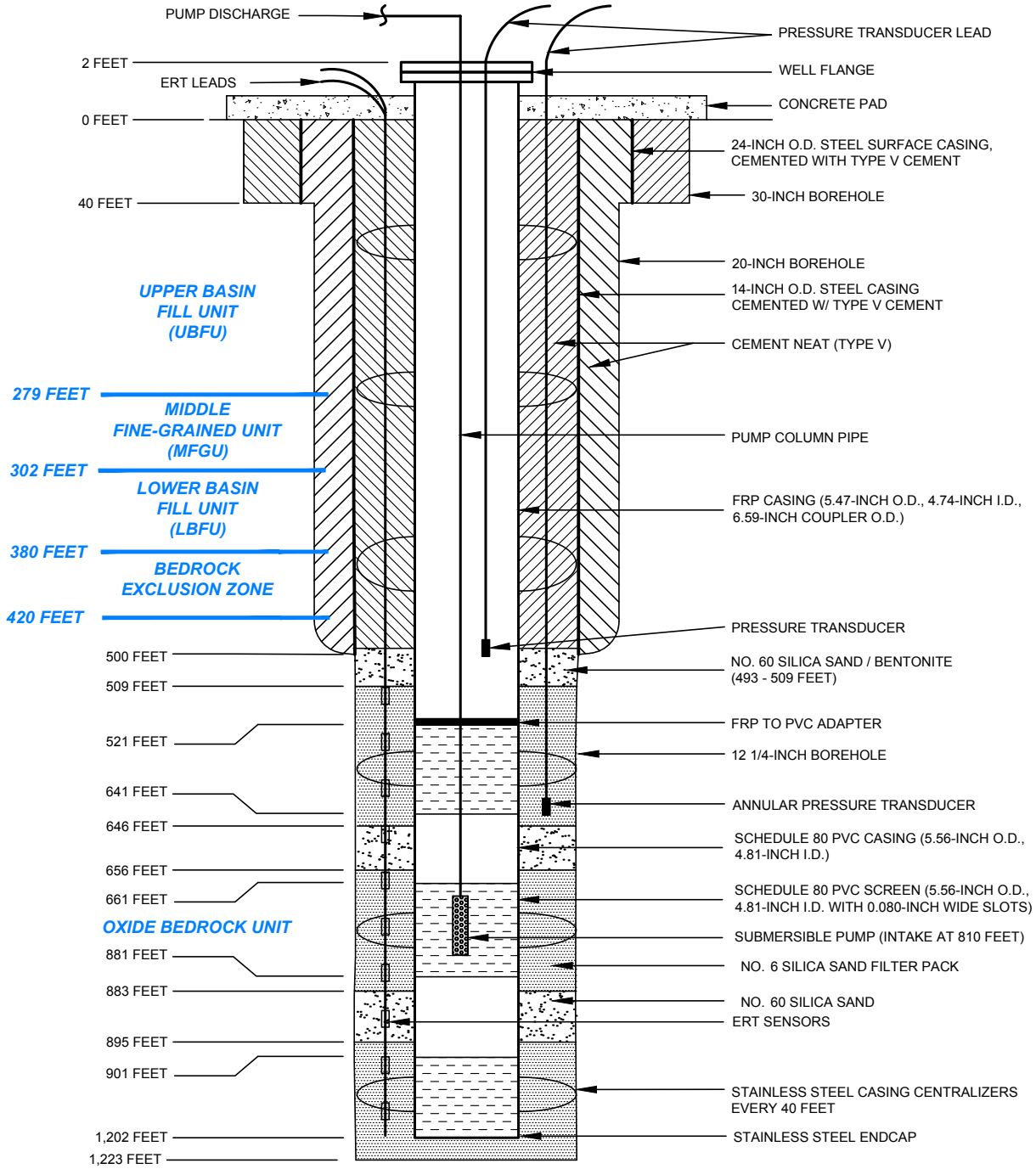
RECOVERY WELL R-05 GEOPHYSICAL DATA AND LITHOLOGIC LOG

FLORENCE COPPER

SCALE: AS SHOWN
SEPTEMBER 2018

FIGURE 3

MCELENEY, TERRI Printed: 8/7/2018 9:45 AM Layout: R05
G:\129687\GLOBAL\CAD\129687-010 GEOPHHYICAL DATA2 2018-0802.DWG



ANNULAR SENSOR DETAILS

- ERT SENSOR DEPTHS - 455, 520, 586, 651, 716, 781, 846, 911, 976, 1041, 1106
- ANNULAR TRANSDUCER DEPTH - 636 FEET

NOTES

1. WELL REGISTRATION NO.: 55-227704
2. CADASTRAL LOCATION: D(4-9) 28 CAC
3. MEASURING POINT ELEVATION; 1480.41 FEET AMSL
4. I.D. = INSIDE DIAMETER
5. O.D. = OUTSIDE DIAMETER
6. PVC = POLYVINYL CHLORIDE
7. FRP = FIBERGLASS REINFORCED PLASTIC
8. ERT = ELECTRICAL RESISTIVITY TOMOGRAHY
9. SOUNDING TUBE INSTALLED TO ~ 500 FEET

HALEY ALDRICH

PRODUCTION TEST FACILITY
FLORENCE COPPER, INC.
FLORENCE, ARIZONA

RECOVERY WELL R-05 AS-BUILT DIAGRAM

FLORENCE COPPER

SCALE: NOT TO SCALE
SEPTEMBER 2018

FIGURE 4

MOBINI, GITA Printed: 8/31/2018 3:00 PM Layout: R-05
E:\PROJECTS\FLORENCE COPPER\CAD\AS-BUILTS\RECOVERY WELLS\129687-011_RECOVERYWELL_AS-BUILT.DWG

APPENDIX A

Arizona Department of Water Resources Well Registry Report

Arizona Department of Water Resources
Water Management Division
P.O. Box 36020 Phoenix, Arizona 85067-6020
(602) 771-8627 • (602) 771-8690 fax
· www.azwater.gov ·

Well Driller Report and Well Log

RECEIVED AUG 20 2019 ADWR

CJ

THIS REPORT MUST BE FILED WITHIN **30 DAYS** OF COMPLETING THE WELL.

PLEASE PRINT CLEARLY USING BLACK OR BLUE INK.

FILE NUMBER: D (4-9) 28 CAC
WELL REGISTRATION NUMBER: **55 - 227704**
PERMIT NUMBER (IF ISSUED):

SECTION 1. DRILLING AUTHORIZATION

Drilling Firm

Mail To:

NAME: Hydro Resources Inc.
ADDRESS: 13027 County Rd. 18 Unit C
CITY / STATE / ZIP: Ft. Lupton, CO 80621

DWR LICENSE NUMBER: 816
TELEPHONE NUMBER: (303) 857-7544
FAX: (303) 857-2826

SECTION 2. REGISTRY INFORMATION

Well Owner

FULL NAME OF COMPANY, ORGANIZATION, OR INDIVIDUAL: Florence Copper Inc.
MAILING ADDRESS: 1575 W. Hunt Hwy
CITY / STATE / ZIP CODE: Florence, AZ 85132
CONTACT PERSON NAME AND TITLE: Ian Ream - Sr. Hydrologist
TELEPHONE NUMBER: (520) 374-3984
FAX:
WELL NAME (e.g., MW-1, PZ-3, Lot 25 Well, Smith Well, etc.): R - 05

Location of Well

WELL LOCATION ADDRESS (IF ANY):

TOWNSHIP (N/S)	RANGE (E/W)	SECTION	160 ACRE	40 ACRE	10 ACRE
4S	9E	28	SW ¼	NE ¼	SW ¼

LATITUDE			LONGITUDE		
33 ° Degrees	2 ' Minutes	59.31"N Seconds	-111 ° Degrees	26 ' Minutes	4.69"W Seconds

METHOD OF LATITUDE/LONGITUDE (CHECK ONE)
☒ *GPS: Hand-Held ☐ *GPS: Survey-Grade

LAND SURFACE ELEVATION AT WELL: 1492 Feet Above Sea Level

METHOD OF ELEVATION (CHECK ONE)
☒ *GPS: Hand-Held ☐ *GPS: Survey-Grade

*GEOGRAPHIC COORDINATE DATUM (CHECK ONE)
☒ NAD-83 ☐ Other (*please specify*):

COUNTY: PINAL
ASSESSOR'S PARCEL ID NUMBER: BOOK | MAP | PARCEL

SECTION 3. WELL CONSTRUCTION DETAILS

Drill Method

CHECK ALL THAT APPLY
☐ Air Rotary
☐ Bored or Augered
☐ Cable Tool
☐ Dual Rotary
☒ Mud Rotary
☒ Reverse Circulation
☐ Driven
☐ Jetted
☐ Air Percussion / Odex Tubing
☐ Other *(please specify)*:

Method of Well Development

CHECK ALL THAT APPLY
☒ Airlift
☐ Bail
☐ Surge Block
☒ Surge Pump
☐ Other *(please specify)*:

Method of Sealing at Reduction Points

CHECK ONE
☐ None
☐ Packed
☐ Swedged
☐ Welded
☐ Other *(please specify)*:

Condition of Well

CHECK ONE
☒ Capped
☐ Pump Installed

Construction Dates

DATE WELL CONSTRUCTION STARTED: 01/20/2018
DATE WELL CONSTRUCTION COMPLETED: 05/24/2018

I state that this notice is filed in compliance with A.R.S. § 45-596 and is complete and correct to the best of my knowledge and belief.

SIGNATURE OF QUALIFYING PARTY:

DATE: 5/24/2018

Well Driller Report and Well Log

WELL REGISTRATION NUMBER
55 - 227704

SECTION 4. WELL CONSTRUCTION DESIGN (AS BUILT) (attach additional page if needed)

Depth

DEPTH OF BORING		DEPTH OF COMPLETED WELL	
1212	Feet Below Land Surface	1201	Feet Below Land Surface

Water Level Information

STATIC WATER LEVEL		DATE MEASURED	TIME MEASURED	IF FLOWING WELL, METHOD OF FLOW REGULATION
220	Feet Below Land Surface	03/02/2018	1 PM	☐ Valve ☐ Other:

Borehole

DEPTH FROM SURFACE		BOREHOLE DIAMETER (inches)
FROM (feet)	TO (feet)	
0	40	30
40	493	20
493	1212	12.25

Installed Casing

DEPTH FROM SURFACE		OUTER DIAMETER (inches)	MATERIAL TYPE (T)				PERFORATION TYPE (T)						SLOT SIZE IF ANY (inches)
FROM (feet)	TO (feet)		STEEL	PVC	ABS	IF OTHER TYPE, DESCRIBE	BLANK OR NONE	WIRE WRAP	SHUTTER SCREEN	MILLS KNIFE	SLOTTED	IF OTHER TYPE, DESCRIBE	
0	40	24.5	X				X						
0	493	14.5	X				X						
0	521	5.44				FRP	X						
521	642	5.56		X							X		.080
642	662	5.56		X			X						
662	882	5.56		X							X		.080
882	902	5.56		X			X						
902	1201	5.56		X							X		.080

Installed Annular Material

DEPTH FROM SURFACE		ANNULAR MATERIAL TYPE (T)								FILTER PACK		
FROM (feet)	TO (feet)	NONE	CONCRETE	NEAT CEMENT OR CEMENT GROUT	CEMENT-BENTONITE GROUT	BENTONITE: GROUT	BENTONITE: CHIPS	BENTONITE: PELLETS	IF OTHER TYPE OF ANNULAR MATERIAL, DESCRIBE	SAND	GRAVEL	SIZE
0	40			X								
0	493			X								
493	509							X				
509	646									X		6-9
646	656							X				
656	883									X		6-9
883	895							X				
895	1212									X		6-9

Well Driller Report and Well Log

WELL REGISTRATION NUMBER
55 - 227704

SECTION 5. GEOLOGIC LOG OF WELL

DEPTH FROM SURFACE		Description	Check (T) every interval where water was encountered (if known)
FROM (feet)	TO (feet)	Describe material, grain size, color, etc.	
0	279	UPPER BASIN FILL UNIT	
279	302	MIDDLE FINE GRAINED UNIT	
302	380		
380	1212	BEDROCK OXIDE UNIT	

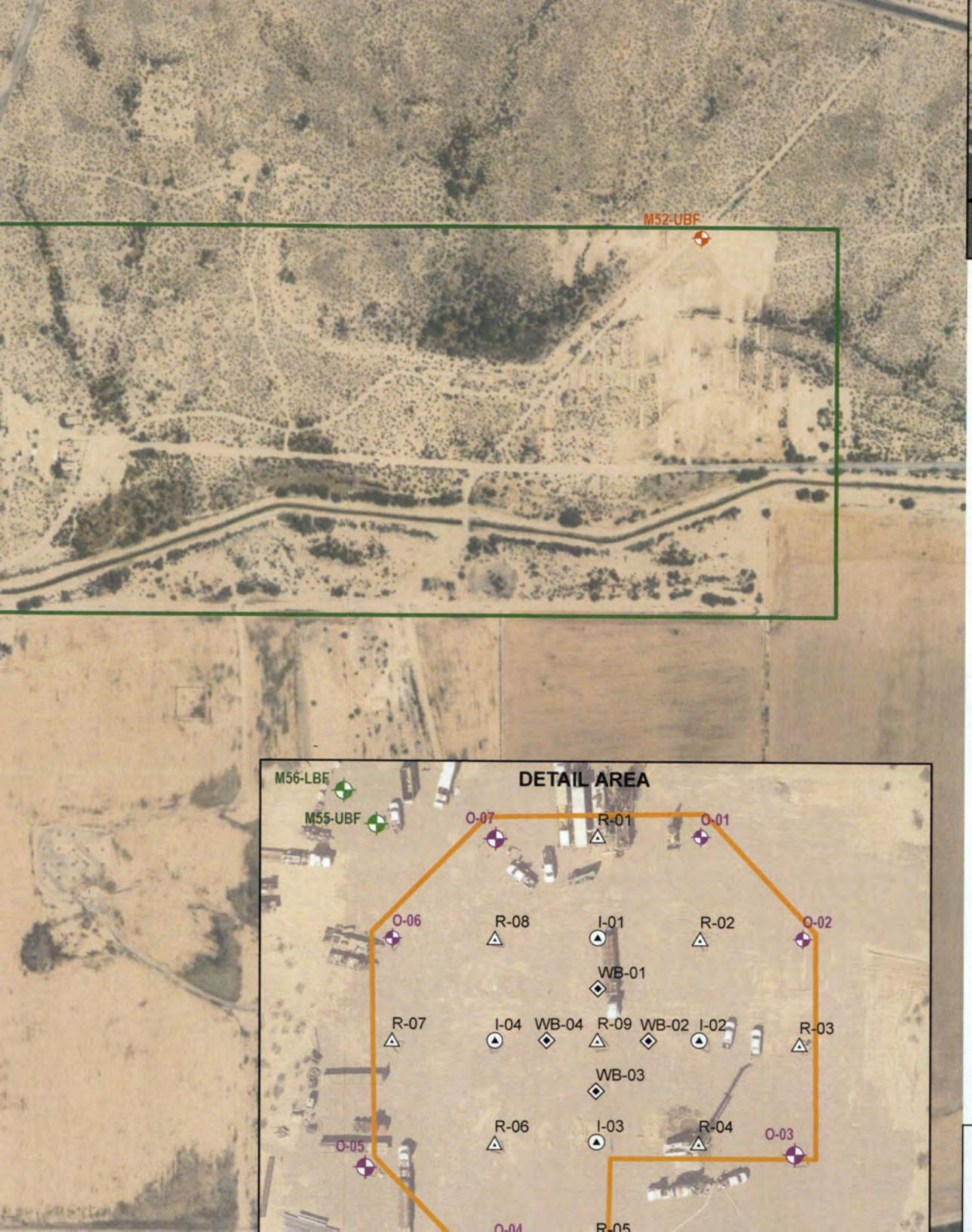
Well Driller Report and Well Log

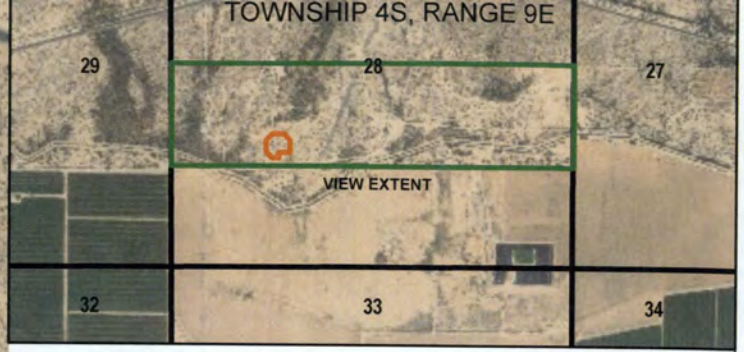
WELL REGISTRATION NUMBER
55 - 227704

SECTION 6. WELL SITE PLAN

NAME OF WELL OWNER	COUNTY ASSESSOR'S PARCEL ID NUMBER		
Florence Copper Inc.	BOOK	MAP	PARCEL

- Please draw the following: (1) the boundaries of property on which the well was located; (2) the well location; (3) the locations of all septic tank systems and sewer systems on the property or within 100 feet of the well location, even if on neighboring properties; and (4) any permanent structures on the property that may aid in locating the well.
- Please indicate the distance between the well location and any septic tank system or sewer system.





0 1,250 2,500
SCALE IN FEET

LEGEND

- OBSERVATION WELL
- SUPPLEMENTAL MONITORING
- POINT-OF-COMPLIANCE WELL

PTF WELL

- INJECTION
- RECOVERY
- WESTBAY WELL
- OPERATIONAL MONITORING
- PTF WELL FIELD
- STATE LAND LEASE

NOTES

1. ALL LOCATIONS AND DIMENSIONS ARE APPROXIMATE.
2. AERIAL IMAGERY SOURCE: ESRI

N

0 500 1,000
SCALE IN FEET

HALEY ALDRICH

FLORENCE COPPER PROJECT
FLORENCE, ARIZONA

Run Date: 09/07/2017

AZ DEPARTMENT OF WATER RESOURCES

WELL REGISTRY REPORT - WELLS55

Location D 4.0 9.0 28 C A C

Well Reg.No 55 - 227704

AMA PINAL AMA

Registered Name FLORENCE COPPER INC
1575 W HUNT HWY
FLORENCE AZ 85132

File Type NEW WELLS (INTENTS OR APPLICATIONS)
Application/Issue Date 08/21/2017

Owner OWNER
Driller No. 816
Driller Name HYDRO RESOURCES - ROCKY MOUNTAIN, INC.
Driller Phone 303-857-7540
County PINAL
Intended Capacity GPM 0.00

Well Type NON-EXEMPT
SubBasin ELOY
Watershed UPPER GILA RIVER
Registered Water Uses INDUSTRIAL
Registered Well Uses WATER PRODUCTION
Discharge Method NO DISCHARGE METHOD LISTED
Power NO POWER CODE LISTED

Well Depth	0.00	**Case Diam**	0.00	**Tested Cap**	0.00
Pump Cap.	0.00	**Case Depth**	0.00	**CRT**	
Draw Down	0.00	**Water Level**	0.00	**Log**	
		Acres Irrig	0.00	**Finish**	NO CASING CODE LISTED

Contamination Site: NO - NOT IN ANY REMEDIAL ACTION SITE

Tribe: Not in a tribal zone

Comments R-5

Current Action

9/1/2017 550 DRILLING AUTHORITY ISSUED
Action Comment: sm

Action History

9/1/2017 555 DRILLER & OWNER PACKETS MAILED
Action Comment: sm

8/29/2017 867 APP/NOI HYDRO/WATER QUALITY REVIEW COMPLETE
Action Comment: pw

8/28/2017 866 APP/NOI SENT TO HYDRO/WATER QUALITY REVIEW
Action Comment: sm

8/21/2017 150 NOI RECEIVED FOR A NEW PRODUCTION WELL
Action Comment: sm

ARIZONA DEPARTMENT OF WATER RESOURCES
GROUNDWATER PERMITTING AND WELLS UNIT
1110 Washington St., Suite 310, Phoenix, AZ 85007-2952

THIS AUTHORIZATION SHALL BE IN THE POSSESSION OF THE DRILLER DURING ALL DRILL OPERATIONS

WELL R-05

WELL REGISTRATION NO: 55-227704

AUTHORIZED DRILLER: HYDRO RESOURCES **LICENSE NO:** 816

A NOTICE OF INTENTION TO DRILL A NON-EXEMPT WELL INSIDE THE PHOENIX ACTIVE MANAGEMENT AREA HAS BEEN GRANTED TO:

WELL OWNER: FLORENCE COOPER, INC. 1575 W HUNT HWY FLORENCE, AZ 85132

The well(s) is/are to be located in the:

SW¼ of the NE¼ of the SW¼ of Section 28, Township 4 South, Range 9 East

No. of well(s) in this project: 1

THIS AUTHORIZATION EXPIRES AT MIDNIGHT ON THE 22TH DAY OF AUGUST, 2018.

GROUNDWATER PERMITTING AND WELLS UNIT

THE DRILLER MUST FILE A LOG OF THE WELL WITHIN 30 DAYS OF COMPLETION OF DRILLING

DOUGLAS A. DUCEY
Governor

THOMAS BUSCHATZKE
Director

ARIZONA DEPARTMENT of WATER RESOURCES
1110 W. Washington St., Suite 310
Phoenix, Arizona 85007-2952
602.771.8500
azwater.gov

September 1, 2017

Ian Ream
Florence Copper, Inc.
1575 W. Hunt Hwy
Florence, AZ 85132

RE: Notice of Intention to Modify an Existing Non-Exempt Well
Well Registration No. 55-227700 thru 55-227708
File No. D (4-9) 28 CCA & CCD

Dear Mr. Ream:

The Notice of Intention to Modify an Existing Non-Exempt Well inside the Pinal Active Management Area has been approved. A copy of the Notice is enclosed for your records. The drilling card for the modification of the above referenced well has been forwarded to your well driller.

Within 30 days of completion of the well, the well driller is required to furnish this Department with a complete and accurate log of the well. In addition, the well owner is required to submit the enclosed Completion Report within 30 days of installation of pump equipment.

Pursuant to the provisions of A.R.S. § 45-604, any person withdrawing groundwater from a well is required to use a water measuring device to record rates of withdrawal in order to provide or allow the computation of an annual volume of pumpage from the well. The total volume of pumpage shall be reported on an annual report. The annual report shall be submitted no later than March 31 following the end of each completed annual reporting period. The first annual report period shall be from the date of this permit through December 31, 2017.

The Department has issued the authorization to modify this well pursuant to A.R.S. §§ 45-596 and 45-597 of the Groundwater Code. The legal nature of the water withdrawn from the well may be the

subject of court action in the future as part of a determination of surface water rights in your area. If there are court proceedings that could affect your well, you will be notified and be given the opportunity to participate.

Under A.R.S. § 45-593, the person to whom a well is registered must notify the Department of a change in ownership, physical characteristics or any other data about the well in order to keep the well registration records current and accurate. Forms may be obtained by contacting the Department, or online at http://www.azwater.gov

If you have any questions about the terms and conditions of the permit or require any administrative corrections to this permit, please contact the Groundwater Permitting Wells Unit at (602) 771-8527.

Sincerely,

Stella Murillo

Stella Murillo, Manager
Groundwater Permitting and Wells Section

Enclosures

R-05

ARIZONA DEPARTMENT OF WATER RESOURCES
GROUNDWATER PERMITTING AND WELLS UNIT
MAIL TO: P.O. BOX 36020, PHOENIX, ARIZONA 85067-6020
1110 W. Washington St. Suite 310, Phoenix, Arizona 85007-2952
Phone (602) 771-8527 Fax (602) 771-8590

RECEIVED
AUG 21 2017
ARIZONA DEPARTMENT OF WATER RESOURCES

NOTICE OF INTENTION TO DRILL A NON-EXEMPT WELL PURSUANT TO A GROUNDWATER WITHDRAWAL PERMIT (OTHER THAN A GENERAL INDUSTRIAL USE PERMIT) IN AN ACTIVE MANAGEMENT AREA

PLEASE READ GENERAL INSTRUCTIONS AND CONDITIONS ON REVERSE SIDE OF THIS FORM BEFORE COMPLETING.
Section § 45-598, Arizona Revised Statutes provides: In an Active Management Area, prior to drilling a well, a person entitled to withdraw groundwater shall file a Notice of Intention to Drill with the Department. Pursuant to A.R.S. § 45-596 and A.A.C. R12-15-104, the filing fee for this application is $150.00.

1. **WELL/LAND LOCATION:**
   4S (Township) N/S 9E (Range) E/W 28 (Section)
   SW ¼ (10 Acre) NE ¼ (40 Acre) SW ¼ (160 Acre)

2. **POSITION LOCATION OF THE WELL:**
   Latitude 33 ° 2 '59.3" N
   Longitude 111 ° 26 '4.70" W

3. **COUNTY** Pinal

4. **APPLICANT**
   Florence Copper, Inc. (Name)
   1575 W Hunt Hwy (Mailing Address)
   Florence (City) AZ (State) 85132 (Zip)
   Telephone No. 520-374-3984

5. **OWNER OF THE LAND OF WELLSITE:**
   AZ State Land (Mineral Lease #11-026500) (Name)
   1616 W Adams Street (Mailing Address)
   Phoenix (City) AZ (State) 85007 (Zip)
   Telephone No. 602-542-4631

6. **THIS NOTICE IS FILED BY:**
   Check one: ☐ Owner ☒ Lessee
   Ian Ream (Name)
   1575 W Hunt Hwy (Mailing Address)
   Florence (City) AZ (State) 85132 (Zip)

7. **DESCRIPTION OF THE PROPOSEDWELL:**
   Diameter 5 Inches
   Depth 1200 Feet
   Type of Casing Steel/FRP/PVC

8. **ESTIMATE OF TOTAL ANNUAL PUMPAGE:**
   48.5 Acre-feet per Year

9. **PRINCIPAL USE OF WATER** (be specific):
   Mineral Extraction

10. **OTHER USES INTENDED** (be specific):
    None

11. **CONSTRUCTION WILL START:**
    September (Month) 2017 (Year)

FOR DEPARTMENT USE ONLY
File No. D(4-9)28 CAC
Filed 8-21-17 By Sm
Input " By "

DUPLICATE
Mailed ____ By Sm
Registration 55- 227704
AMA/INA PINAL

12. **CLAIM OF ENTITLEMENT TO WITHDRAW GROUNDWATER:**
    Permit 59- 562120.0005

13. **DRILLING FIRM:**
    HydroResources (Name)
    13027 County Rd 18, Unit C (Mailing Address)
    Fort Lupton (City) CO (State) 80621 (Zip)
    303-857-7540 (Telephone No.)
    816 (DWR License Number)
    A-4 (ROC License Category)

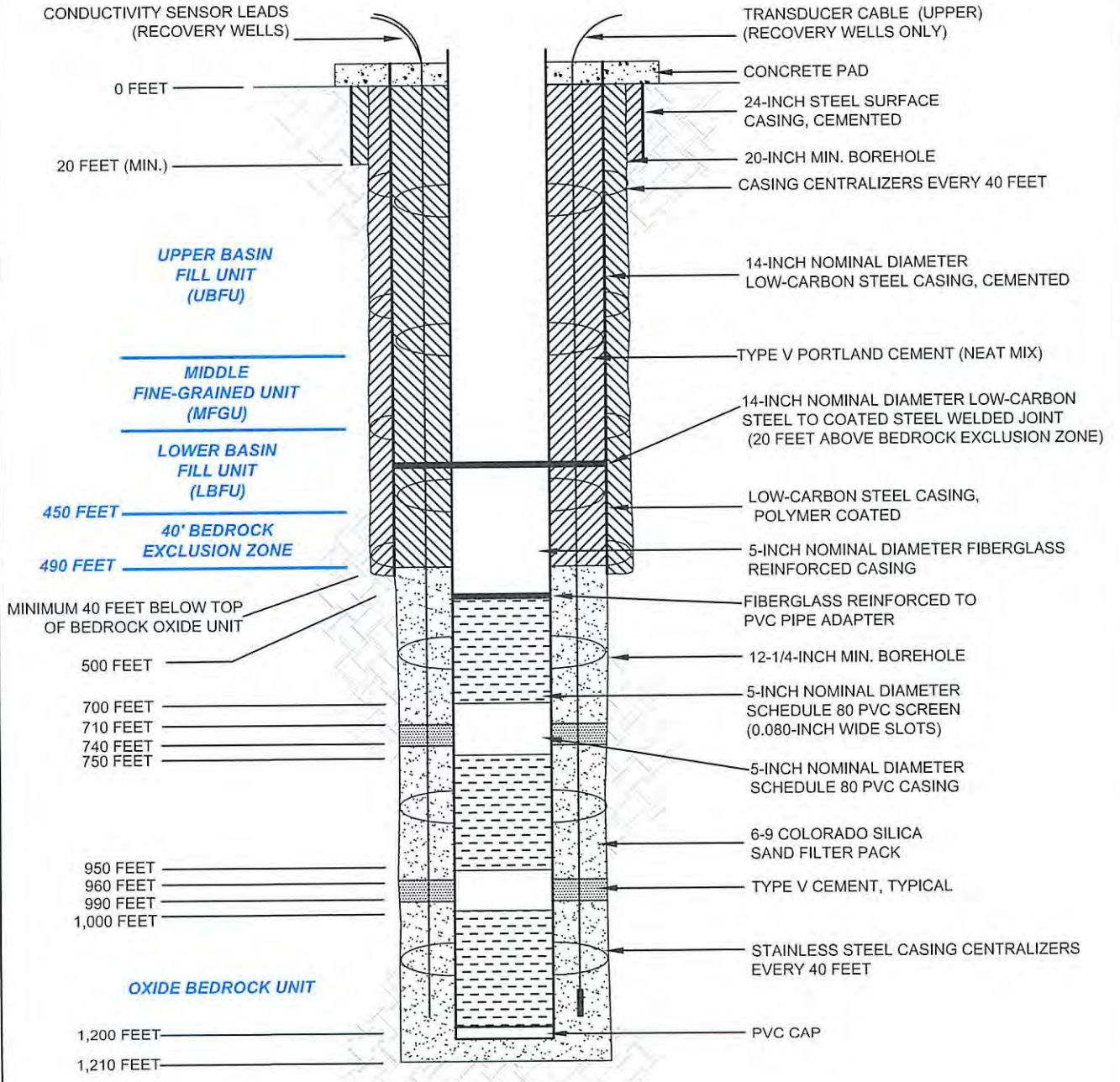
14. **Is the proposed well within 100 feet of a septic tank system, sewage area, landfill, hazardous waste facility or storage area of hazardous material or a petroleum storage area and tank?** ☐ Yes ☒ No

15. **Attach a detailed construction diagram of the proposed well design. The diagram should provide verification of consistency with minimum construction requirements. Specifically, the diagram should include an indication of the perforated interval location(s) in relationship to the expected water level; the depth and thickness of the surface seal, and grouting material used; whether the surface or conductor casing will extend above grade; and vault details, if specified.**

I state that this Notice is filed in compliance with Rules A.A.C. R12-15-809 and R12-15-816(F), and is complete and correct to the best of my knowledge and belief, and that I understand the conditions set forth on the reverse side of this form.

Ian Ream — Signature — Senior Hydrogeologist — 8-17-17

Type or Print Name and | **Signature** ☐ Land Owner ☒ Lessee of well site | **Title** | **Date**



G:\PROJECTS\CURIS RESOURCES\38706-CURIS FEASIBILITY\DRAWINGS\2014 UIC APP\FIGURES MM-1 WELL CONST DGRM JUNE2015 UPDATE.DWG

HALEY ALDRICH

FLORENCE COPPER, INC.
FLORENCE, ARIZONA

R-05
WELL CONSTRUCTION DIAGRAM

FLORENCE COPPER INC.

SCALE: NOT TO SCALE

FIGURE 1

ARIZONA DEPARTMENT OF WATER RESOURCES

GROUNDWATER PERMITTING AND WELLS UNIT
1110 W. Washington St. Suite 310, Phoenix, Arizona 85007-2952
Phone (602) 771-8585 Fax (602) 771-8688

WELL CONSTRUCTION SUPPLEMENT (form DWR 55-90)

Well Registration Number 55- 227704

1. **Well Location:**

   SW (10AC) ¼ of the NE (40AC) ¼ of the SW (160AC) ¼, Sec. 28, Township 4S Range 9E.

2. **Position Location of the Well:**

   Latitude 33 ° 2 ' 59.3 " **Longitude** 111 °26 ' 4.70 "

   Datum: ✓ NAD 83 • NAD 27 • Other: _____

3. **County** PINAL.

4. **Date construction to start:** SEPTEMBER 2017.

5. **Time period well will remain in use:** 5 YEARS.

6. **Is pump equipment to be installed?** YES **If so, design pump capacity:** 30 **GPM.**

7. **Well construction plan:**

   a. **Drilling method (mud rotary, hollow-stem auger, etc.)** MUD ROTARY.

   b. **Borehole diameters** 30 **inches from** 0 **feet to** 20 **feet.**
   20 (12.25) **inches from** 20 **feet to** 490 (1210) **feet.**

   c. **Casing materials** STEEL/FIBERGLASS REINFORCED PLASTIC/PVC.

   d. **Method of well development (bail, air lift, surge, etc.)** AIRLIFT, SURGE.

   e. **Will surface or conductor casing extend above grade?** NO.

8. **Include a detailed construction diagram of the proposed well design. The diagram should verify consistency with minimum construction requirements specified in the Department's well construction rules found in Arizona Administrative Code (A.A.C.) R12-15-801 *et seq*. Specifically, the diagram should include borehole diameters; casing materials and diameters; perforation intervals; the expected water level; depth and thickness of the surface seal; proposed grouting materials; and the length that the surface or conductor casing will extend above grade, or vault details, if specified.**

   Pursuant to Arizona Revised Statutes (A.R.S.) § 45-594.B, all well construction, replacement, deepening and abandonment operations shall comply with the rules adopted pursuant to this section. Therefore, any existing well that is deepened or modified must be brought into compliance with minimum well construction standards specified above, if not already in compliance.

9. **Proposed materials and method of abandonment if well is to be abandoned after project is completed (Minimum requirements per A.A.C. R12-15-816):**

   _____

10. Is the proposed wellsite within 100 feet of a septic tank system, sewage disposal area, landfill, hazardous waste facility, storage area of hazardous material, or petroleum storage area or tank? _____Yes __X__No

11. Is this well to monitor existing contamination? ____Yes __X__No

Potential contamination?_____Yes __X__No If yes, please provide explanation:_____

_____

12. Name of Consulting firm, if any: HALEY & ALDRICH, INC.

400 E VAN BUREN STREET SUITE 545	PHOENIX	AZ	85004
Address	**City**	**State**	**Zip**

Contact Person: LAUREN CANDREVA Telephone Number: 602-760-2429

13. Drilling firm HYDRORESOURCES

DWR License Number: 816 ROC License Category: A-4

14. Special construction standards, if any, required pursuant to A.A.C. R12-15-821:_____

_____

I (we), Ian Ream (print name) hereby affirm that all information provided in this application is true and correct to the best of my/our knowledge and belief.

Signature of Applicant _____ Date 8-17-2017

Memorandum

To: Stella Murillo, Groundwater Permitting and Wells
From: Phil Whitmore, Groundwater Permitting and Wells
CC: Jeff Tannler, Statewide AMA Director
Date: 8/29/2017
Subject: Review of Application for a Permit to Drill or Operate Nine Non-exempt Wells within an Active Management Area
59-562120 55-227700-08 D(4-9)CAC & CBD
Florence Copper, Inc.

ADWR has reviewed the above-referenced applications for nine (9) permits to drill and operate a non-exempt well in the Pinal AMA. This hydrologist review is limited to conformance with well construction standards only.

The applicant proposes to withdraw 48.5 acre-feet per year from 8 of the new wells and 97 acre-feet per year from one well pursuant to the applicant's Mineral Extraction Withdrawal permit (59-562120.0005).

Well Construction

The applicant proposes that all nine (9) wells will be drilled and constructed in the same manner and drill depths. Each well will be 1210 feet deep with three (3) 200-foot screen intervals all open in the bedrock aquifer only. Eight of wells will have 5-inch and one will have 8-inch diameter inner casing constructed with PVC and include elements to reduce chemical corrosion.

The applications each included proposed well construction diagrams indicating that the outer annulus of the wells will be sealed from the surface to 20 feet below land surface and an inner annulus will be sealed to 490 below land surface. The estimated contact of the lower basin fill unit and the crystalline bedrock is approximately 490 feet deep.

The well diagrams did not indicate the height of well stick up and the applicant did not include a request for variance. However, if stick up is to be less than 1 foot above land surface a request for variance should be submitted to comply with Arizona Administrative Code R12-15-820.

Conclusion

We recommend issuing a permit to drill and operate all nine (9) non-exempt wells in the proposed location, at the volume and well construction specifications stated in the application.

Printed: 8/21/2017 4:03:39 PM

Arizona Department of Water Resources

1110 West Washington Street, Suite 310
Phoenix AZ 85007

Customer:
LINDA DOMBROWSKI
70 BLANCHARD ROAD
BURLINGTON, MA 01803

Receipt #: 18-53412
Office: MAIN OFFICE
Receipt Date: 08/21/2017
Sale Type: IN_PERSON
Cashier: WRSAM

Item No.	Function Code	AOBJ	Description	Ref ID	Qty	Unit Price	Ext Price
67491	122221	4439-TT	Permit to drill non-exempt well in an active management area	227704	1	150.00	150.00
					RECEIPT TOTAL:		**150.00**

Payment type: CREDIT CARD
Amount Paid: $150.00
Payment Received Date: 08/21/2017

Authorization 189991565

Notes: FROM TTA.

No refund without valid receipt

APPENDIX B

Lithologic Log

HALEY ALDRICH

LITHOLOGIC LOG

R-05

Project	Production Test Facility, Florence, Arizona	File No. 129687
Client	Florence Copper, Inc.	Sheet No. 1 of 15
Contractor	Cascade Drilling LLC	Cadastral Location D (4-9) 28 CAC

Drilling Method	Reverse Rotary	Land Surface Elevation	1477.37 feet, amsl	Start	20 January 2018
Borehole Diameter(s)	30/20/12.25 in.	Datum	State Plane NAD 83	Finish	5 February 2018
Rig Make & Model	Midway 3500	Location	N 745,990 E 847,694	H&A Rep.	C. Giusti

Depth (ft)	Elevation	USCS Symbol	Stratum Change Depth (ft)	VISUAL-MANUAL IDENTIFICATION AND DESCRIPTION	COMMENTS
0	1475	SM		**SILTY SAND (0-7 feet)** Primarily fine to medium sand with ~20% fines and ~10% gravel to 11 mm. Gravel is subangular to rounded and sand is subangular to subrounded. Weak HCl reaction. Fines have low plasticity, have low toughness, low dry strength, and are red brown (7.5YR 4/4). **UBFU**	
5	1470	SC	7	**CLAYEY SAND with GRAVEL (7-10 feet)** Well graded sands with ~15% fines and ~20% gravel to 119 mm. Gravel is subangular to rounded and sand is subangular to subrounded. Weak HCl reaction. Fines are medium plasticity, have low toughness, high dry strength, and are red brown (7.5YR 4/4). **UBFU**	**Well Registry ID:** 55-227704 **Surface Completion:** Bolted Sealed Well Flange **Well casing stickup:** 1.98 feet als *COLOR IDENTIFICATION MADE WITH WET SAMPLES USING MUNSELL CHART*
10	1465	SW-SM	10	**WELL GRADED SAND with SILT and GRAVEL (10-51 feet)** Well graded sands with ~10% fines and ~25% gravel to 121 mm. Gravel is subangular to rounded and sand is subangular to subrounded. Weak HCl reaction. Fines have low plasticity, have low toughness, low dry strength, and are red brown (7.5YR 4/4). **UBFU**	
15	1460				
20	1455				
25	1450				
30	1445				
35	1440				
40	1435				**Surface Casing:** 24-inch mild steel; 0 - 40 feet **Overburden Casing:** 14-inch mild steel; 0 - 493 feet **Well Casing:** Nominal 5-inch diameter Fiberglass Reinforced; -1.98 - 521 feet
45	1430				
50	1425	CL	51	**SANDY LEAN CLAY (51-90 feet)** Primarily fines with ~30% sand and trace gravels up to 16 mm. Sands are subangular to subrounded and gravel are subangular to rounded. Fines have medium plasticity, low toughness, medium dry strength, are light reddish brown (5YR 6/4), and weak reaction to HCL. **UBFU**	
55	1420				
60	1415				**Unit Intervals:** UBFU: 0 - 279 feet MGFU: 279 - 302 feet LBFU: 302 - 380 feet Oxide Bedrock: 380 - 1223 feet
65	1410				
70	1405				
75					

NOTE: Lithologic descrptions, group symbols, and grain-size determinations based on the USCS visual-manual method (Haley & Aldrich OP2001A - Field Practice for Soil Identification and Description).

R-05

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Depth (ft)	Elevation	USCS Symbol	Stratum Change Depth (ft)	VISUAL-MANUAL IDENTIFICATION AND DESCRIPTION	
75	1400				
80	1395				
85	1390				
90	1385	SW-SC	90	**WELL GRADED SAND with CLAY (90-100 feet)** Primarily fine to medium sand with ~10% fines and ~10% gravel up to 13 mm. Sands are subangular to subrounded and gravels are subangular to rounded. Fines have low plasticity, low toughness, low dry strength, are light brown (7.5YR 6/4), and weak reaction to HCL. **UBFU**	
95	1380				
100	1375	CL	100	**SANDY LEAN CLAY (100-105 feet)** Primarily fines with ~30% sand and trace gravel up to 5 mm. Sands are subangular to subrounded and gravels are subangular to rounded. Fines have medium plasticity, low toughness, medium dry strength, are reddish brown (5YR 5/4), and weak reaction to HCL. **UBFU**	**Seal:** Type V neat cement 0 - 493 feet Fine sand/bentonite 493 - 509
105	1370	SC	105	**CLAYEY SAND (105-110 feet)** Primarily fine to medium sand with ~30% fines and ~5% gravel up to 8 mm. Sands and gravels are subangular to subrounded. Fines have medium plasticity, low toughness, low dry strength, are reddish brown (5YR 5/4), and no reaction to HCL. **UBFU**	
110	1365	SW	110	**WELL GRADED SAND with GRAVEL (110-115 feet)** Primarily fine to medium sand with ~5% fines and ~15% gravel up to 18 mm. Sands and gravels are subangular to subrounded. Fines have low plasticity, low toughness, low dry strength, are brown (7.5YR 5/3), and no reaction to HCL. **UBFU**	
115	1360	CH	115	**FAT CLAY (115-125 feet)** Primarily fines with ~10% sand and no gravel. Sands are subangular to subrounded. Fines have high plasticity, high toughness, high dry strength, are light reddish brown (5YR 6/4), and weak reaction to HCL. **UBFU**	
120	1355				
125	1350	CL	125	**LEAN CLAY WITH SAND (125-150 feet)** Primarily fines with ~20% sand and trace gravels up to 6 mm. Sands and gravels are subangular to subrounded. Fines have low plasticity, medium toughness, high dry strength, are light brown (7.55YR 6/3), and no reaction to HCL. **UBFU**	
130	1345				
135	1340				
140	1335				
145	1330				
150	1325	SW	150	**WELL GRADED SAND with GRAVEL (150-155 feet)** Primarily fine to medium sand with ~5% fines and ~15% gravel up to 16 mm. Sands are subangular to subrounded and gravels are subangular to rounded. Fines have low plasticity, low toughness, low dry strength, are brown (7.5YR 5/3), and no reaction to HCL. **UBFU**	
155	1320	SC	155	**CLAYEY SAND (155-170 feet)** Primarily fine to coarse sand with ~40% fines and ~10% gravel up to 9mm. Sand is subangular to rounded and gravel is subangular to subrounded. Fines have medium plasticity, low toughness, medium dry strength, are light brown (7.5YR 6/3), and weak reaction to HCL. **UBFU**	
160					

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Depth (ft)	Elevation	USCS Symbol	Stratum Change Depth (ft)	VISUAL-MANUAL IDENTIFICATION AND DESCRIPTION
165	1315			
170	1310	CL	170	**LEAN CLAY with SAND (170-175 feet)** Primarily fines with ~25% sand and trace gravel up to 7mm. Sand is subangular to rounded and gravel is subangular to subrounded. Fines have medium plasticity, medium toughness, high dry strength, are brown (7.5YR 6/3), and weak reaction to HCL. **UBFU**
175	1305	SW-SC	175	**WELL GRADED SAND with CLAY and GRAVEL (175-230 feet)** Primarily coarse to medium sand with ~10% fines and ~15% gravel up to 25mm. Sand is subangular to subrounded and gravel is subangular to subrounded. Fines have low plasticity, low toughness, medium dry strength, are light brown (7.5YR 6/4), and weak reaction to HCL.**UBFU**
180	1300			
185	1295			
190	1290			
195	1285			
200	1280			
205	1275			
210	1270			
215	1265			
220	1260			
225	1255			
230	1250	SC	230	**CLAYEY SAND (230-250 feet)** Primarily fine to medium sand with ~40% fines and ~5% gravel up to 11mm. Sand is subangular and gravel is subangular to subrounded. Fines have medium plasticity, medium toughness, high dry strength, are reddish brown (5YR 4/4), and weak reaction to HCL. **UBFU**
235	1245			
240	1240			
245	1235			
	1230			

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Depth (ft)	Elevation	USCS Symbol	Stratum Change Depth (ft)	VISUAL-MANUAL IDENTIFICATION AND DESCRIPTION
250	1225	SW-SC	250	**WELL GRADED SAND with CLAY and GRAVEL (250-279 feet)** Primarily coarse to fine sand with ~10% fines and ~15% gravel up to 52mm. Sand is subangular to subrounded and gravel is subangular to subrounded. Fines have low plasticity, low toughness, low dry strength, are light brown (7.5YR 6/3), and weak reaction to HCL.**UBFU**
280	1195	CH	279	**FAT CLAY (279-302 feet)** Primarily fines with ~20% sands and trace gravel up to 8mm. Sand is subangular to subrounded and gravel is subangular. Fines have high plasticity, high toughness, high dry strength, are reddish brown (5YR 5/3), and weak reaction to HCL. **MGFU**
300	1175	SW-SC	302	**WELL GRADED SAND with CLAY (302-355 feet)** Primarily medium to coarse sand with ~10% fines and ~10% gravel up to 18mm. Sand is subangular to rounded and gravel is subangular to subrounded. Fines have low plasticity, low toughness, low dry strength, are light brown (7.5YR 6/4), and weak reaction to HCL. **LBFU**
335	1145			

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Depth (ft)	Elevation	USCS Symbol	Stratum Change Depth (ft)	VISUAL-MANUAL IDENTIFICATION AND DESCRIPTION
340	1140			
345	1135			
350	1130			
355	1125			
360	1120	SC	355	**CLAYEY SAND (355-380 feet)** Primarily medium sands with ~15% fines and ~10% gravel up to 14mm. Sand is subangular to rounded and gravel is subangular to subrounded. Fines have low plasticity, low toughness, low dry strength, are reddish brown (5YR 5/3), and weak reaction to HCL. **LBFU**
365	1115			
370	1110			
375	1105			
380	1100			
385	1095		380	**QUARTZ MONZONITE (380-820 feet)** Consists of quartz at approximately 35%, potassium feldspars at approximately 35%, plagioclase at approximately 25%, and biotite at approximately 5%.
390	1090			
395	1085			
400	1080			
405	1075			
410	1070			
415	1065			
420	1060			
			422	

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Depth (ft)	Elevation	USCS Symbol	Stratum Change Depth (ft)	VISUAL-MANUAL IDENTIFICATION AND DESCRIPTION
420	1055			**QUARTZ MONZONITE (380-820 feet)** Continued
425	1050			
430	1045			
435	1040			
440	1035			
445	1030			
450	1025			
455	1020			
460	1015			
465	1010			
470	1005			
475	1000			
480	995			
485	990			
490	985			
495	980			
500	975			
505	970			

Filter Pack: No. 60 Silica Sand 509 - 646, 656 - 883, 895 - 1212 feet
Fine Sand Intervals: 646 - 656, 883 - 895 feet
Thread Adapter: Stainless Steel, SCH 80 F480 PVC to API; 521

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Depth (ft)	Elevation	USCS Symbol	Stratum Change Depth (ft)	VISUAL-MANUAL IDENTIFICATION AND DESCRIPTION	
510	965		509	**QUARTZ MONZONITE (380-820 feet)** Continued	feet
515	960				
520	955				**Well Screen:** Nominal 5-inch diameter, SCH 80 PVC Screen (0.080-inch slots); 521 - 641, 661 - 881, 901 - 1201 feet **ERT Sensor Depths:** 455, 520, 585, 651, 716, 781, 846, 911, 976, 1041, 1106 feet
525	950				
530	945				
535	940				
540	935				
545	930				
550	925				
555	920				
560	915				
565	910				
570	905				
575	900				
580	895				
585	890				
590	885				
595					

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Depth (ft)	Elevation	USCS Symbol	Stratum Change Depth (ft)	VISUAL-MANUAL IDENTIFICATION AND DESCRIPTION
			596	**QUARTZ MONZONITE (380-820 feet)** Continued
600	880			
605	875			
610	870			
615	865			
620	860			
625	855			
630	850			
635	845			
640	840			
645	835			
650	830			
655	825			
660	820			
665	815			
670	810			
675	805			
680	800			
	795		682	

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Depth (ft)	Elevation	USCS Symbol	Stratum Change Depth (ft)	VISUAL-MANUAL IDENTIFICATION AND DESCRIPTION
685	790			**QUARTZ MONZONITE (380-820 feet)** Continued
690	785			
695	780			
700	775			
705	770			
710	765			
715	760			
720	755			
725	750			
730	745			
735	740			
740	735			
745	730			
750	725			
755	720			
760	715			
765	710			
			769	

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Depth (ft)	Elevation	USCS Symbol	Stratum Change Depth (ft)	VISUAL-MANUAL IDENTIFICATION AND DESCRIPTION
770	705			**QUARTZ MONZONITE (380-820 feet)** Continued
775	700			
780	695			
785	690			
790	685			
795	680			
800	675			
805	670			
810	665			
815	660			
820	655		820	**DIORITE (820-840 feet)** Consists mostly of plagioclase, with approximately 20% amphiboles, and 5% biotite.
825	650			
830	645			
835	640			
840	635		840	**QUARTZ MONZONITE (840-1210 feet)** Consists of quartz at approximately 35%, potassium feldspars at approximately 35%, plagioclase at approximately 25%, and biotite at approximately 5%.
845	630			
850	625			
855			856	

NOTE: Lithologic descrptions, group symbols, and grain-size determinations based on the USCS visual-manual method (Haley & Aldrich OP2001A - Field Practice for Soil Identification and Description).

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Depth (ft)	Elevation	USCS Symbol	Stratum Change Depth (ft)	VISUAL-MANUAL IDENTIFICATION AND DESCRIPTION
860	620			**QUARTZ MONZONITE (840-1210 feet)** Continued
865	615			
870	610			
875	605			
880	600			
885	595			
890	590			
895	585			
900	580			
905	575			
910	570			
915	565			
920	560			
925	555			
930	550			
935	545			
940	540			
	535		943	

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Depth (ft)	Elevation	USCS Symbol	Stratum Change Depth (ft)	VISUAL-MANUAL IDENTIFICATION AND DESCRIPTION
945	530			**QUARTZ MONZONITE (840-1210 feet)** Continued
950	525			
955	520			
960	515			
965	510			
970	505			
975	500			
980	495			
985	490			
990	485			
995	480			
1000	475			
1005	470			
1010	465			
1015	460			
1020	455			
1025	450			

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Depth (ft)	Elevation	USCS Symbol	Stratum Change Depth (ft)	VISUAL-MANUAL IDENTIFICATION AND DESCRIPTION
1030	445		1030	**QUARTZ MONZONITE (840-1210 feet)** Continued
1035	440			
1040	435			
1045	430			
1050	425			
1055	420			
1060	415			
1065	410			
1070	405			
1075	400			
1080	395			
1085	390			
1090	385			
1095	380			
1100	375			
1105	370			
1110	365			
1115				

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Depth (ft)	Elevation	USCS Symbol	Stratum Change Depth (ft)	VISUAL-MANUAL IDENTIFICATION AND DESCRIPTION
	360		1117	**QUARTZ MONZONITE (840-1210 feet)** Continued
1120	355			
1125	350			
1130	345			
1135	340			
1140	335			
1145	330			
1150	325			
1155	320			
1160	315			
1165	310			
1170	305			
1175	300			
1180	295			
1185	290			
1190	285			
1195	280			
1200	275			

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Depth (ft)	Elevation	USCS Symbol	Stratum Change Depth (ft)	VISUAL-MANUAL IDENTIFICATION AND DESCRIPTION	
			1204	**QUARTZ MONZONITE (840-1210 feet)** Continued	
1205	270				
1210			1210	**GRANODIORITE (1210-1223 feet)** Contains mostly plagioclase in a gray aphanitic matrix with biotite crystals composing approximately 10%.	
	265				
1215					
	260				
1220					
	255		1223		**Total Borehole Depth:** Driller = 1223 feet; Geophysical Logging = 1212 feet

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APPENDIX C

Chemical Characteristics of Formation Water

May 23, 2018

Barbara Sylvester
Brown & Caldwell
201 E. Washington Suite 500
Phoenix, AZ 85004

TEL (602) 567-3894
FAX -

Work Order No.: 18D0619
Order Name: Florence Copper

RE: PTF

Dear Barbara Sylvester,

Turner Laboratories, Inc. received 2 sample(s) on 04/25/2018 for the analyses presented in the following report.

All results are intended to be considered in their entirety, and Turner Laboratories, Inc. is not responsible for use of less than the complete report. Results apply only to the samples analyzed. Samples will be disposed of 30 days after issue of our report unless special arrangements are made.

The pages that follow may contain sensitive, privileged or confidential information intended solely for the addressee named above. If you receive this message and are not the agent or employee of the addressee, this communication has been sent in error. Please do not disseminate or copy any of the attached and notify the sender immediately by telephone. Please also return the attached sheet(s) to the sender by mail.

Please call if you have any questions.

Respectfully submitted,

Turner Laboratories, Inc.
ADHS License AZ0066

Kevin Brim
Project Manager

Client: Brown & Caldwell
Project: PTF
Work Order: 18D0619
Date Received: 04/25/2018

Order: Florence Copper

Work Order Sample Summary

Lab Sample ID	Client Sample ID	Matrix	Collection Date/Time
18D0619-01	R-09	Ground Water	04/23/2018 1555
18D0619-02	TB	Ground Water	04/25/2018 0000

Client: Brown & Caldwell
Project: PTF
Work Order: 18D0619
Date Received: 04/25/2018

Case Narrative

The 8015D analysis was performed by TestAmerica Laboratories, Inc. in Phoenix, AZ.

The radiochemistry analysis was performed by Radiation Safety Engineering, Inc. in Chandler, AZ.

D5	Minimum Reporting Limit (MRL) is adjusted due to sample dilution; analyte was non-detect in the sample.
H5	This test is specified to be performed in the field within 15 minutes of sampling; sample was received and analyzed past the regulatory holding time.
M3	The spike recovery value is unusable since the analyte concentration in the sample is disproportionate to the spike level. The associated LCS/LCSD recovery was acceptable.

All soil, sludge, and solid matrix determinations are reported on a wet weight basis unless otherwise noted.

ND	Not Detected at or above the PQL
PQL	Practical Quantitation Limit
DF	Dilution Factor
PRL	Project Reporting Limit

Turner Laboratories, Inc.

Date: 05/23/2018

Client: Brown & Caldwell
Project: PTF
Work Order: 18D0619
Lab Sample ID: 18D0619-01

Client Sample ID: R-09
Collection Date/Time: 04/23/2018 1555
Matrix: Ground Water
Order Name: Florence Copper

Analyses	Result	PRL	PQL	Qual	Units	DF	Prep Date	Analysis Date	Analyst
ICP Dissolved Metals-E 200.7 (4.4)									
Calcium	140		4.0	M3	mg/L	1	04/27/2018 1440	05/04/2018 1150	MH
Iron	ND		0.30		mg/L	1	04/27/2018 1440	05/04/2018 1150	MH
Magnesium	27		3.0		mg/L	1	04/27/2018 1440	05/04/2018 1150	MH
Potassium	6.8		5.0		mg/L	1	04/27/2018 1440	05/04/2018 1150	MH
Sodium	170		5.0	M3	mg/L	1	04/27/2018 1440	05/04/2018 1150	MH
ICP/MS Dissolved Metals-E 200.8 (5.4)									
Aluminum	ND		0.0800	D5	mg/L	2	04/27/2018 1440	05/07/2018 1139	MH
Antimony	ND		0.00050		mg/L	1	04/27/2018 1440	05/07/2018 1133	MH
Arsenic	0.0016		0.00050		mg/L	1	04/27/2018 1440	05/07/2018 1133	MH
Barium	0.071		0.00050		mg/L	1	04/27/2018 1440	05/07/2018 1133	MH
Beryllium	ND		0.00050	D5	mg/L	2	04/27/2018 1440	05/07/2018 1139	MH
Cadmium	ND		0.00025		mg/L	1	04/27/2018 1440	05/07/2018 1133	MH
Chromium	0.0051		0.00050		mg/L	1	04/27/2018 1440	05/07/2018 1133	MH
Cobalt	ND		0.00025		mg/L	1	04/27/2018 1440	05/07/2018 1133	MH
Copper	0.011		0.00050		mg/L	1	04/27/2018 1440	05/07/2018 1133	MH
Lead	ND		0.00050		mg/L	1	04/27/2018 1440	05/07/2018 1133	MH
Manganese	0.0020		0.00025		mg/L	1	04/27/2018 1440	05/07/2018 1133	MH
Nickel	0.0033		0.00050		mg/L	1	04/27/2018 1440	05/07/2018 1133	MH
Selenium	ND		0.0025		mg/L	1	04/27/2018 1440	05/07/2018 1133	MH
Thallium	ND		0.00050		mg/L	1	04/27/2018 1440	05/07/2018 1133	MH
Zinc	ND		0.040		mg/L	1	04/27/2018 1440	05/07/2018 1133	MH
CVAA Dissolved Mercury-E 245.1									
Mercury	ND		0.0010		mg/L	1	04/26/2018 0955	04/26/2018 1639	MH
pH-E150.1									
pH (pH Units)	7.8			H5	-	1	04/26/2018 1615	04/26/2018 1616	AP
Temperature (°C)	22			H5	-	1	04/26/2018 1615	04/26/2018 1616	AP
ICP/MS Total Metals-E200.8 (5.4)									
Uranium	0.016		0.00050		mg/L	1	04/27/2018 1230	04/30/2018 1348	MH

Client: Brown & Caldwell
Project: PTF
Work Order: 18D0619
Lab Sample ID: 18D0619-01

Client Sample ID: R-09
Collection Date/Time: 04/23/2018 1555
Matrix: Ground Water
Order Name: Florence Copper

Analyses	Result	PRL	PQL	Qual	Units	DF	Prep Date	Analysis Date	Analyst
Anions by Ion Chromatography-E300.0 (2.1)									
Chloride	310		25		mg/L	25	04/26/2018 1225	04/26/2018 1415	AP
Fluoride	ND		0.50		mg/L	1	04/25/2018 1208	04/25/2018 1544	AP
Nitrogen, Nitrate (As N)	8.8		0.50		mg/L	1	04/25/2018 1208	04/25/2018 1544	AP
Nitrogen, Nitrite (As N)	ND		0.10		mg/L	1	04/25/2018 1208	04/25/2018 1544	AP
Sulfate	190		130		mg/L	25	04/26/2018 1225	04/26/2018 1415	AP
Cyanide-E335.4									
Cyanide	ND		0.10		mg/L	1	04/26/2018 0845	04/30/2018 1545	AP
Alkalinity-SM2320B									
Alkalinity, Bicarbonate (As CaCO3)	150		2.0		mg/L	1	05/03/2018 1030	05/03/2018 1210	EJ
Alkalinity, Carbonate (As CaCO3)	ND		2.0		mg/L	1	05/03/2018 1030	05/03/2018 1210	EJ
Alkalinity, Hydroxide (As CaCO3)	ND		2.0		mg/L	1	05/03/2018 1030	05/03/2018 1210	EJ
Alkalinity, Phenolphthalein (As CaCO3)	ND		2.0		mg/L	1	05/03/2018 1030	05/03/2018 1210	EJ
Alkalinity, Total (As CaCO3)	150		2.0		mg/L	1	05/03/2018 1030	05/03/2018 1210	EJ
Specific Conductance-SM2510 B									
Conductivity	1700		0.20		µmhos/cm	2	05/09/2018 1315	05/09/2018 1330	AP
Total Dissolved Solids (Residue, Filterable)-SM2540 C									
Total Dissolved Solids (Residue, Filterable)	1000		20		mg/L	1	04/26/2018 0826	05/01/2018 1600	EJ
Volatile Organic Compounds by GC/MS-SW8260B									
Benzene	ND		0.50		ug/L	1	05/07/2018 1824	05/07/2018 1943	KP
Carbon disulfide	ND		2.0		ug/L	1	05/07/2018 1824	05/07/2018 1943	KP
Ethylbenzene	ND		0.50		ug/L	1	05/07/2018 1824	05/07/2018 1943	KP
Toluene	ND		0.50		ug/L	1	05/07/2018 1824	05/07/2018 1943	KP
Xylenes, Total	ND		1.5		ug/L	1	05/07/2018 1824	05/07/2018 1943	KP
Surr: 4-Bromofluorobenzene	*95*	*70-130*			*%REC*	*1*	*05/07/2018 1824*	*05/07/2018 1943*	*KP*
Surr: Dibromofluoromethane	*101*	*70-130*			*%REC*	*1*	*05/07/2018 1824*	*05/07/2018 1943*	*KP*
Surr: Toluene-d8	*77*	*70-130*			*%REC*	*1*	*05/07/2018 1824*	*05/07/2018 1943*	*KP*

Client: Brown & Caldwell
Project: PTF
Work Order: 18D0619
Lab Sample ID: 18D0619-02

Client Sample ID: TB
Collection Date/Time: 04/25/2018 0000
Matrix: Ground Water
Order Name: Florence Copper

Analyses	Result	PRL	PQL	Qual	Units	DF	Prep Date	Analysis Date	Analyst
Volatile Organic Compounds by GC/MS-SW8260B									
Benzene	ND		0.50		ug/L	1	05/07/2018 1824	05/07/2018 2344	KP
Carbon disulfide	ND		2.0		ug/L	1	05/07/2018 1824	05/07/2018 2344	KP
Ethylbenzene	ND		0.50		ug/L	1	05/07/2018 1824	05/07/2018 2344	KP
Toluene	ND		0.50		ug/L	1	05/07/2018 1824	05/07/2018 2344	KP
Xylenes, Total	ND		1.5		ug/L	1	05/07/2018 1824	05/07/2018 2344	KP
Surr: 4-Bromofluorobenzene	*101*	*70-130*			*%REC*	*1*	*05/07/2018 1824*	*05/07/2018 2344*	*KP*
Surr: Dibromofluoromethane	*110*	*70-130*			*%REC*	*1*	*05/07/2018 1824*	*05/07/2018 2344*	*KP*
Surr: Toluene-d8	*103*	*70-130*			*%REC*	*1*	*05/07/2018 1824*	*05/07/2018 2344*	*KP*

Client: Brown & Caldwell
Project: PTF
Work Order: 18D0619
Date Received: 04/25/2018

QC Summary

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Qual
Batch 1804269 - E 245.1										
Blank (1804269-BLK1)				Prepared & Analyzed: 04/26/2018						
Mercury	ND	0.0010	mg/L							
LCS (1804269-BS1)				Prepared & Analyzed: 04/26/2018						
Mercury	0.0049	0.0010	mg/L	0.005000		98	85-115			
LCS Dup (1804269-BSD1)				Prepared & Analyzed: 04/26/2018						
Mercury	0.0048	0.0010	mg/L	0.005000		95	85-115	2	20	
Matrix Spike (1804269-MS1)		**Source: 18D0394-01**		Prepared & Analyzed: 04/26/2018						
Mercury	0.0050	0.0010	mg/L	0.005000	0.00020	97	85-115			
Matrix Spike Dup (1804269-MSD1)		**Source: 18D0394-01**		Prepared & Analyzed: 04/26/2018						
Mercury	0.0050	0.0010	mg/L	0.005000	0.00020	96	85-115	1	20	
Batch 1804292 - E200.8 (5.4)										
Blank (1804292-BLK1)				Prepared & Analyzed: 04/30/2018						
Uranium	ND	0.00050	mg/L							
LCS (1804292-BS1)				Prepared & Analyzed: 04/30/2018						
Uranium	0.046	0.00050	mg/L	0.05000		92	85-115			
LCS Dup (1804292-BSD1)				Prepared & Analyzed: 04/30/2018						
Uranium	0.046	0.00050	mg/L	0.05000		92	85-115	0.2	20	
Matrix Spike (1804292-MS1)		**Source: 18D0614-01**		Prepared & Analyzed: 04/30/2018						
Uranium	0.051	0.00050	mg/L	0.05000	0.0015	99	70-130			
Batch 1805051 - E 200.7 (4.4)										
Blank (1805051-BLK1)				Prepared & Analyzed: 05/04/2018						
Calcium	ND	4.0	mg/L							
Iron	ND	0.30	mg/L							
Magnesium	ND	3.0	mg/L							
Potassium	ND	5.0	mg/L							
Sodium	ND	5.0	mg/L							
LCS (1805051-BS1)				Prepared & Analyzed: 05/04/2018						
Calcium	11	4.0	mg/L	10.00		109	85-115			
Iron	1.0	0.30	mg/L	1.000		104	85-115			
Magnesium	10	3.0	mg/L	10.00		105	85-115			
Potassium	10	5.0	mg/L	10.00		105	85-115			
Sodium	10	5.0	mg/L	10.00		105	85-115			
LCS Dup (1805051-BSD1)				Prepared & Analyzed: 05/04/2018						
Calcium	11	4.0	mg/L	10.00		110	85-115	1	20	
Iron	1.0	0.30	mg/L	1.000		105	85-115	0.5	20	
Magnesium	10	3.0	mg/L	10.00		105	85-115	0.06	20	
Potassium	10	5.0	mg/L	10.00		105	85-115	0.05	20	
Sodium	11	5.0	mg/L	10.00		109	85-115	4	20	

Client: Brown & Caldwell
Project: PTF
Work Order: 18D0619
Date Received: 04/25/2018

QC Summary

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Qual
Batch 1805051 - E 200.7 (4.4)										
Matrix Spike (1805051-MS1)	**Source: 18D0619-01**			Prepared & Analyzed: 05/04/2018						
Calcium	150	4.0	mg/L	10.00	140	59	70-130			M3
Iron	1.1	0.30	mg/L	1.000	0.028	105	70-130			
Magnesium	38	3.0	mg/L	10.00	27	108	70-130			
Potassium	17	5.0	mg/L	10.00	6.8	105	70-130			
Sodium	170	5.0	mg/L	10.00	170	30	70-130			M3
Matrix Spike (1805051-MS2)	**Source: 18E0021-01**			Prepared & Analyzed: 05/04/2018						
Calcium	64	4.0	mg/L	10.00	54	103	70-130			
Iron	1.0	0.30	mg/L	1.000	0.0060	101	70-130			
Magnesium	21	3.0	mg/L	10.00	11	99	70-130			
Potassium	15	5.0	mg/L	10.00	4.7	104	70-130			
Sodium	99	5.0	mg/L	10.00	90	87	70-130			
Batch 1805069 - E 200.8 (5.4)										
Blank (1805069-BLK1)				Prepared & Analyzed: 05/07/2018						
Aluminum	ND	0.0400	mg/L							
Antimony	ND	0.00050	mg/L							
Arsenic	ND	0.00050	mg/L							
Barium	ND	0.00050	mg/L							
Beryllium	ND	0.00025	mg/L							
Cadmium	ND	0.00025	mg/L							
Chromium	ND	0.00050	mg/L							
Cobalt	ND	0.00025	mg/L							
Copper	ND	0.00050	mg/L							
Lead	ND	0.00050	mg/L							
Manganese	ND	0.00025	mg/L							
Nickel	ND	0.00050	mg/L							
Selenium	ND	0.0025	mg/L							
Thallium	ND	0.00050	mg/L							
Zinc	ND	0.040	mg/L							
LCS (1805069-BS1)				Prepared & Analyzed: 05/07/2018						
Aluminum	0.104	0.0400	mg/L	0.1000		104	85-115			
Antimony	0.048	0.00050	mg/L	0.05000		96	85-115			
Arsenic	0.050	0.00050	mg/L	0.05000		100	85-115			
Barium	0.050	0.00050	mg/L	0.05000		100	85-115			
Beryllium	0.049	0.00025	mg/L	0.05000		97	85-115			
Cadmium	0.050	0.00025	mg/L	0.05000		100	85-115			
Chromium	0.051	0.00050	mg/L	0.05000		102	85-115			
Cobalt	0.051	0.00025	mg/L	0.05000		101	85-115			
Copper	0.051	0.00050	mg/L	0.05000		103	85-115			
Lead	0.049	0.00050	mg/L	0.05000		98	85-115			
Manganese	0.050	0.00025	mg/L	0.05000		101	85-115			
Nickel	0.051	0.00050	mg/L	0.05000		102	85-115			
Selenium	0.051	0.0025	mg/L	0.05000		103	85-115			
Thallium	0.050	0.00050	mg/L	0.05000		101	85-115			
Zinc	0.10	0.040	mg/L	0.1000		101	85-115			

Client: Brown & Caldwell
Project: PTF
Work Order: 18D0619
Date Received: 04/25/2018

QC Summary

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Qual
Batch 1805069 - E 200.8 (5.4)										
LCS Dup (1805069-BSD1)				Prepared & Analyzed: 05/07/2018						
Aluminum	0.115	0.0400	mg/L	0.1000		115	85-115	10	20	
Antimony	0.048	0.00050	mg/L	0.05000		96	85-115	0.7	20	
Arsenic	0.050	0.00050	mg/L	0.05000		101	85-115	0.8	20	
Barium	0.051	0.00050	mg/L	0.05000		102	85-115	1	20	
Beryllium	0.049	0.00025	mg/L	0.05000		97	85-115	0.2	20	
Cadmium	0.050	0.00025	mg/L	0.05000		100	85-115	0.2	20	
Chromium	0.051	0.00050	mg/L	0.05000		102	85-115	0.4	20	
Cobalt	0.050	0.00025	mg/L	0.05000		101	85-115	0.5	20	
Copper	0.052	0.00050	mg/L	0.05000		105	85-115	2	20	
Lead	0.049	0.00050	mg/L	0.05000		98	85-115	0.1	20	
Manganese	0.050	0.00025	mg/L	0.05000		101	85-115	0.09	20	
Nickel	0.051	0.00050	mg/L	0.05000		103	85-115	0.8	20	
Selenium	0.052	0.0025	mg/L	0.05000		104	85-115	2	20	
Thallium	0.050	0.00050	mg/L	0.05000		101	85-115	0.06	20	
Zinc	0.10	0.040	mg/L	0.1000		104	85-115	3	20	
Matrix Spike (1805069-MS1)		**Source: 18D0693-01**		Prepared & Analyzed: 05/07/2018						
Aluminum	0.239	0.0400	mg/L	0.1000	0.166	74	70-130			
Antimony	0.045	0.00050	mg/L	0.05000	0.00024	90	70-130			
Arsenic	0.056	0.00050	mg/L	0.05000	0.0035	104	70-130			
Barium	0.16	0.00050	mg/L	0.05000	0.12	94	70-130			
Beryllium	0.045	0.00025	mg/L	0.05000	0.000029	90	70-130			
Cadmium	0.047	0.00025	mg/L	0.05000	ND	94	70-130			
Chromium	0.049	0.00050	mg/L	0.05000	0.00052	98	70-130			
Cobalt	0.048	0.00025	mg/L	0.05000	0.00097	95	70-130			
Copper	0.051	0.00050	mg/L	0.05000	0.0020	98	70-130			
Lead	0.047	0.00050	mg/L	0.05000	0.00016	94	70-130			
Manganese	0.054	0.00025	mg/L	0.05000	0.0075	94	70-130			
Nickel	0.049	0.00050	mg/L	0.05000	0.0018	94	70-130			
Selenium	0.057	0.0025	mg/L	0.05000	ND	114	70-130			
Thallium	0.048	0.00050	mg/L	0.05000	0.000038	96	70-130			
Zinc	0.11	0.040	mg/L	0.1000	ND	109	70-130			

Client: Brown & Caldwell
Project: PTF
Work Order: 18D0619
Date Received: 04/25/2018

QC Summary

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Qual
Batch 1804261 - SM2540 C										
Duplicate (1804261-DUP1)		**Source: 18D0606-01**		Prepared: 04/26/2018 Analyzed: 04/27/2018						
Total Dissolved Solids (Residue, Filterable)	630	20	mg/L		630			0.3	5	
Duplicate (1804261-DUP2)		**Source: 18D0606-02**		Prepared: 04/26/2018 Analyzed: 04/27/2018						
Total Dissolved Solids (Residue, Filterable)	610	20	mg/L		620			0.8	5	
Batch 1804268 - E335.4										
Blank (1804268-BLK1)				Prepared: 04/26/2018 Analyzed: 04/30/2018						
Cyanide	ND	0.10	mg/L							
LCS (1804268-BS1)				Prepared: 04/26/2018 Analyzed: 04/30/2018						
Cyanide	2.0	0.10	mg/L	2.000		101	90-110			
LCS Dup (1804268-BSD1)				Prepared: 04/26/2018 Analyzed: 04/30/2018						
Cyanide	2.0	0.10	mg/L	2.000		101	90-110	0.1	20	
Matrix Spike (1804268-MS1)		**Source: 18D0602-03**		Prepared: 04/26/2018 Analyzed: 04/30/2018						
Cyanide	2.1	0.10	mg/L	2.000	ND	103	90-110			
Matrix Spike Dup (1804268-MSD1)		**Source: 18D0602-03**		Prepared: 04/26/2018 Analyzed: 04/30/2018						
Cyanide	2.0	0.10	mg/L	2.000	ND	98	90-110	5	20	
Batch 1804272 - E150.1										
Duplicate (1804272-DUP1)		**Source: 18D0662-02**		Prepared & Analyzed: 04/26/2018						
pH (pH Units)	7.8		-		7.8			0.1	200	H5
Temperature (°C)	21		-		21			2	200	H5
Batch 1805027 - SM2320B										
LCS (1805027-BS1)				Prepared & Analyzed: 05/03/2018						
Alkalinity, Total (As CaCO3)	240	2.0	mg/L	250.0		96	90-110			
LCS Dup (1805027-BSD1)				Prepared & Analyzed: 05/03/2018						
Alkalinity, Total (As CaCO3)	240	2.0	mg/L	250.0		96	90-110	0	10	
Matrix Spike (1805027-MS1)		**Source: 18D0606-02**		Prepared & Analyzed: 05/03/2018						
Alkalinity, Total (As CaCO3)	370	2.0	mg/L	250.0	130	96	85-115			
Matrix Spike Dup (1805027-MSD1)		**Source: 18D0606-02**		Prepared & Analyzed: 05/03/2018						
Alkalinity, Total (As CaCO3)	370	2.0	mg/L	250.0	130	95	85-115	0.5	10	
Batch 1805103 - SM2510 B										
LCS (1805103-BS1)				Prepared & Analyzed: 05/09/2018						
Conductivity	140	0.10	µmhos/cm	141.2		101	0-200			
LCS Dup (1805103-BSD1)				Prepared & Analyzed: 05/09/2018						
Conductivity	140	0.10	µmhos/cm	141.2		101	0-200	0.7	200	
Duplicate (1805103-DUP1)		**Source: 18E0192-01**		Prepared & Analyzed: 05/09/2018						
Conductivity	4.0	0.10	µmhos/cm		4.0			0	10	

Client: Brown & Caldwell
Project: PTF
Work Order: 18D0619
Date Received: 04/25/2018

QC Summary

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Qual
Batch 1805074 - SW8260B										
Blank (1805074-BLK1)				Prepared & Analyzed: 05/07/2018						
Benzene	ND	0.50	ug/L							
Carbon disulfide	ND	2.0	ug/L							
Ethylbenzene	ND	0.50	ug/L							
Toluene	ND	0.50	ug/L							
Xylenes, Total	ND	1.5	ug/L							
Surrogate: 4-Bromofluorobenzene	*25.0*		*ug/L*	*25.00*		*100*	*70-130*			
Surrogate: Dibromofluoromethane	*26.9*		*ug/L*	*25.00*		*107*	*70-130*			
Surrogate: Toluene-d8	*25.1*		*ug/L*	*25.00*		*100*	*70-130*			
LCS (1805074-BS1)				Prepared & Analyzed: 05/07/2018						
1,1-Dichloroethene	29		ug/L	25.00		114	70-130			
Benzene	27		ug/L	25.00		109	70-130			
Chlorobenzene	29		ug/L	25.00		115	70-130			
Toluene	25		ug/L	25.00		101	70-130			
Trichloroethene	26		ug/L	25.00		103	70-130			
Surrogate: 4-Bromofluorobenzene	*24.6*		*ug/L*	*25.00*		*98*	*70-130*			
Surrogate: Dibromofluoromethane	*25.6*		*ug/L*	*25.00*		*102*	*70-130*			
Surrogate: Toluene-d8	*24.8*		*ug/L*	*25.00*		*99*	*70-130*			
LCS Dup (1805074-BSD1)				Prepared & Analyzed: 05/07/2018						
1,1-Dichloroethene	27		ug/L	25.00		110	70-130	4	30	
Benzene	26		ug/L	25.00		104	70-130	5	30	
Chlorobenzene	26		ug/L	25.00		105	70-130	9	30	
Toluene	24		ug/L	25.00		96	70-130	5	30	
Trichloroethene	25		ug/L	25.00		98	70-130	4	30	
Surrogate: 4-Bromofluorobenzene	*24.4*		*ug/L*	*25.00*		*98*	*70-130*			
Surrogate: Dibromofluoromethane	*26.1*		*ug/L*	*25.00*		*104*	*70-130*			
Surrogate: Toluene-d8	*25.1*		*ug/L*	*25.00*		*100*	*70-130*			
Matrix Spike (1805074-MS1)	**Source: 18D0582-02**			Prepared & Analyzed: 05/07/2018						
1,1-Dichloroethene	27		ug/L	25.00	0.070	109	70-130			
Benzene	26		ug/L	25.00	0.020	104	70-130			
Chlorobenzene	26		ug/L	25.00	0.0	105	70-130			
Toluene	27		ug/L	25.00	3.5	95	70-130			
Trichloroethene	24		ug/L	25.00	0.040	97	70-130			
Surrogate: 4-Bromofluorobenzene	*24.4*		*ug/L*	*25.00*		*98*	*70-130*			
Surrogate: Dibromofluoromethane	*26.4*		*ug/L*	*25.00*		*106*	*70-130*			
Surrogate: Toluene-d8	*24.9*		*ug/L*	*25.00*		*100*	*70-130*			
Matrix Spike Dup (1805074-MSD1)	**Source: 18D0582-02**			Prepared & Analyzed: 05/07/2018						
1,1-Dichloroethene	27		ug/L	25.00	0.070	108	70-130	0.8	30	
Benzene	25		ug/L	25.00	0.020	101	70-130	2	30	
Chlorobenzene	26		ug/L	25.00	0.0	105	70-130	0.3	30	
Toluene	27		ug/L	25.00	3.5	95	70-130	0.1	30	
Trichloroethene	24		ug/L	25.00	0.040	95	70-130	2	30	
Surrogate: 4-Bromofluorobenzene	*24.7*		*ug/L*	*25.00*		*99*	*70-130*			
Surrogate: Dibromofluoromethane	*26.4*		*ug/L*	*25.00*		*106*	*70-130*			
Surrogate: Toluene-d8	*25.3*		*ug/L*	*25.00*		*101*	*70-130*			

Client: Brown & Caldwell
Project: PTF
Work Order: 18D0619
Date Received: 04/25/2018

QC Summary

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Qual
Batch 1804245 - E300.0 (2.1)										
Blank (1804245-BLK1)				Prepared & Analyzed: 04/25/2018						
Chloride	ND	1.0	mg/L							
Fluoride	ND	0.50	mg/L							
Nitrogen, Nitrate (As N)	ND	0.50	mg/L							
Nitrogen, Nitrite (As N)	ND	0.10	mg/L							
Sulfate	ND	5.0	mg/L							
LCS (1804245-BS1)				Prepared & Analyzed: 04/25/2018						
Chloride	12	1.0	mg/L	12.50		92	90-110			
Fluoride	2.0	0.50	mg/L	2.000		101	90-110			
Nitrogen, Nitrate (As N)	4.7	0.50	mg/L	5.000		95	90-110			
Nitrogen, Nitrite (As N)	2.3	0.10	mg/L	2.500		92	90-110			
Sulfate	12	5.0	mg/L	12.50		96	90-110			
LCS Dup (1804245-BSD1)				Prepared & Analyzed: 04/25/2018						
Chloride	12	1.0	mg/L	12.50		94	90-110	2	10	
Fluoride	2.0	0.50	mg/L	2.000		101	90-110	0.4	10	
Nitrogen, Nitrate (As N)	4.9	0.50	mg/L	5.000		98	90-110	3	10	
Nitrogen, Nitrite (As N)	2.4	0.10	mg/L	2.500		95	90-110	3	10	
Sulfate	12	5.0	mg/L	12.50		98	90-110	3	10	
Matrix Spike (1804245-MS1)		**Source: 18D0613-08**		Prepared & Analyzed: 04/25/2018						
Fluoride	3.7	0.50	mg/L	2.000	1.7	100	80-120			
Nitrogen, Nitrate (As N)	4.7	0.50	mg/L	5.000	0.22	89	80-120			
Matrix Spike (1804245-MS2)		**Source: 18D0625-01**		Prepared & Analyzed: 04/26/2018						
Nitrogen, Nitrate (As N)	5.0	0.50	mg/L	5.000	0.46	92	80-120			
Nitrogen, Nitrite (As N)	2.2	0.10	mg/L	2.500	ND	88	80-120			
Matrix Spike (1804245-MS3)		**Source: 18D0614-01RE1**		Prepared & Analyzed: 04/26/2018						
Chloride	17		mg/L	12.50	6.4	88	80-120			
Sulfate	28		mg/L	12.50	18	85	80-120			
Matrix Spike Dup (1804245-MSD1)		**Source: 18D0613-08**		Prepared & Analyzed: 04/25/2018						
Fluoride	3.7	0.50	mg/L	2.000	1.7	100	80-120	0.4	10	
Nitrogen, Nitrate (As N)	4.7	0.50	mg/L	5.000	0.22	90	80-120	0.6	10	
Matrix Spike Dup (1804245-MSD2)		**Source: 18D0625-01**		Prepared & Analyzed: 04/26/2018						
Nitrogen, Nitrate (As N)	5.1	0.50	mg/L	5.000	0.46	92	80-120	0.2	10	
Nitrogen, Nitrite (As N)	2.2	0.10	mg/L	2.500	ND	88	80-120	0.4	10	
Matrix Spike Dup (1804245-MSD3)		**Source: 18D0614-01RE1**		Prepared & Analyzed: 04/26/2018						
Chloride	18		mg/L	12.50	6.4	89	80-120	0.6	10	
Sulfate	29		mg/L	12.50	18	86	80-120	0.6	10	

TURNER LABORATORIES INC.
2445 N. Coyote Drive, Suite 104
Tucson, Arizona 85745
(520) 882-5880
Fax: (520) 882-9788
www.turnerlabs.com

CHAIN OF CUSTODY/LABORATORY ANALYSIS REQUEST FORM

TURNER WORK ORDER # 18D0619 DATE 4/23/18 PAGE 1 OF 1

PROJECT NAME Florence Copper # _____

CONTACT NAME : Barb Sylvester

COMPANY NAME : Brown and Caldwell

ADDRESS : 2 N Central Ave, Suite 1600

CITY Phoenix STATE AZ ZIP CODE 85004

PHONE 602-567-3894 FAX

SAMPLER'S SIGNATURE

CIRCLE ANALYSIS REQUESTED AND/OR CHECK THE APPROPRIATE BOX

SAMPLE I.D.	DATE	TIME	LAB I.D.	SAMPLE MATRIX*	NUMBER OF CONTAINERS	Diss Metals - list (Field Filtered)	Total Uranium (not Filtered)	Inorganics - list	Cyanide (free)	Organics - list	G.Alpha, (RadSafety sub)	Uranium activity if G. Alpha >12	Ra226, 228, Ra-Tot (RadsSafety)	TPH-D (TestAmerica Sub)
R-09	4-23-18	1555		GW	10	X	X	X	X	X	X	X	X	X
8260 TB	4-23-18	1600		GW	1					X				
				GW										
				GW										
				GW										
				GW										
				GW										
				GW										
				GW										
				GW										
				GW										
				GW										

1. RELINQUISHED BY:
Signature
Printed Name Caleb Caiosh
Firm HA
Date/Time 4-23-18 1630

2. RECEIVED BY: UPS
Signature
Printed Name
Firm
Date/Time

TURNAROUND REQUIREMENTS:
X Standard (approx10 days)*
___Next day ___2 Day ___5 Day*
___ Email Preliminary Results To:
* Working Days

REPORT REQUIREMENTS:
X I. Routine Report
___ II. Report (includes DUP,MS,MSD, as required, may be charged as samples)
___ III. Date Validation Report (Includes All Raw Data)
Add 10% to invoice

INVOICE INFORMATION:
Account X Y ___ N
P.O. # _____
Bill to: Florence Copper

SAMPLE RECEIPT:
Total Containers _____
Temperature 2.2
☑ Wet Ice ☐ Blue Ice

3. RELINQUISHED BY: UPS
Signature
Printed Name
Firm
Date/Time

4. RECEIVED BY:
Signature Joseph Catalano
Printed Name
Firm TURNER LABORATORIES INC.
4/23/18 1006
Date/Time

*LEGEND
DW = DRINKING WATER
GW = GROUNDWATER
SD = SOLID
SG = SLUDGE
SL = SOIL
ST = STORMWATER
WW = WASTEWATER

SPECIAL INSTRUCTIONS/COMMENTS:

Compliance Analysis: ☐ Yes ☐ No	Custody Seals ☐	Preservation Confirmation ☒
ADEQ Forms: ☐ Yes ☐ No	Container Intact ☒	Appropriate Head Space ☐
Mail ADEQ Forms: ☐ Yes ☐ No	COC/Labels Agree ☐	Received Within Hold Time ☒

TestAmerica

THE LEADER IN ENVIRONMENTAL TESTING

ANALYTICAL REPORT

TestAmerica Laboratories, Inc.
TestAmerica Phoenix
4625 East Cotton Ctr Blvd
Suite 189
Phoenix, AZ 85040
Tel: (602)437-3340

TestAmerica Job ID: 550-101943-1
Client Project/Site: 18D0619

For:
Turner Laboratories, Inc.
2445 North Coyote Drive
Suite 104
Tucson, Arizona 85745

Attn: Kevin Brim

Authorized for release by:
5/16/2018 12:23:25 PM

Ken Baker, Project Manager II
(602)659-7624
ken.baker@testamericainc.com

LINKS

Review your project results through TotalAccess

Have a Question? Ask The Expert

Visit us at: www.testamericainc.com

This report has been electronically signed and authorized by the signatory. Electronic signature is intended to be the legally binding equivalent of a traditionally handwritten signature.

Results relate only to the items tested and the sample(s) as received by the laboratory.

Table of Contents

Definitions/Glossary

Client: Turner Laboratories, Inc.
Project/Site: 18D0619

TestAmerica Job ID: 550-101943-1

Qualifiers

GC Semi VOA

Qualifier	Qualifier Description
Q9	Insufficient sample received to meet method QC requirements.

Glossary

Abbreviation	These commonly used abbreviations may or may not be present in this report.
¤	Listed under the "D" column to designate that the result is reported on a dry weight basis
%R	Percent Recovery
CFL	Contains Free Liquid
CNF	Contains No Free Liquid
DER	Duplicate Error Ratio (normalized absolute difference)
Dil Fac	Dilution Factor
DL	Detection Limit (DoD/DOE)
DL, RA, RE, IN	Indicates a Dilution, Re-analysis, Re-extraction, or additional Initial metals/anion analysis of the sample
DLC	Decision Level Concentration (Radiochemistry)
EDL	Estimated Detection Limit (Dioxin)
LOD	Limit of Detection (DoD/DOE)
LOQ	Limit of Quantitation (DoD/DOE)
MDA	Minimum Detectable Activity (Radiochemistry)
MDC	Minimum Detectable Concentration (Radiochemistry)
MDL	Method Detection Limit
ML	Minimum Level (Dioxin)
NC	Not Calculated
ND	Not Detected at the reporting limit (or MDL or EDL if shown)
PQL	Practical Quantitation Limit
QC	Quality Control
RER	Relative Error Ratio (Radiochemistry)
RL	Reporting Limit or Requested Limit (Radiochemistry)
RPD	Relative Percent Difference, a measure of the relative difference between two points
TEF	Toxicity Equivalent Factor (Dioxin)
TEQ	Toxicity Equivalent Quotient (Dioxin)

Case Narrative

Client: Turner Laboratories, Inc.
Project/Site: 18D0619

TestAmerica Job ID: 550-101943-1

Job ID: 550-101943-1

Laboratory: TestAmerica Phoenix

Narrative

Job Narrative
550-101943-1

Comments
No additional comments.

Receipt
The sample was received on 4/27/2018 10:50 AM; the sample arrived in good condition, properly preserved and, where required, on ice. The temperature of the cooler at receipt was 3.8º C.

GC Semi VOA
Method(s) 8015D: Insufficient sample volume was available to perform a matrix spike/matrix spike duplicate/sample duplicate (MS/MSD) associated with preparation batch 550-145985 and analytical batch 550-146884. Affected samples have been added a Q9 qualifier. 18D0619-01 (550-101943-1)

No additional analytical or quality issues were noted, other than those described above or in the Definitions/Glossary page.

Organic Prep
Method(s) 3510C: Insufficient sample volume was available to perform a matrix spike/matrix spike duplicate (MS/MSD) associated with 3510C.

No additional analytical or quality issues were noted, other than those described above or in the Definitions/Glossary page.

Sample Summary

Client: Turner Laboratories, Inc.
Project/Site: 18D0619

TestAmerica Job ID: 550-101943-1

Lab Sample ID	Client Sample ID	Matrix	Collected	Received
550-101943-1	18D0619-01	Water	04/23/18 15:55	04/27/18 10:50

Detection Summary

Client: Turner Laboratories, Inc.
Project/Site: 18D0619

TestAmerica Job ID: 550-101943-1

Client Sample ID: 18D0619-01

Lab Sample ID: 550-101943-1

Analyte	Result	Qualifier	RL		Unit	Dil Fac	D	Method	Prep Type
ORO (C22-C32)	0.21	Q9	0.20		mg/L	1		8015D	Total/NA

This Detection Summary does not include radiochemical test results.

Client Sample Results

Client: Turner Laboratories, Inc.
Project/Site: 18D0619

TestAmerica Job ID: 550-101943-1

Client Sample ID: 18D0619-01
Date Collected: 04/23/18 15:55
Date Received: 04/27/18 10:50

Lab Sample ID: 550-101943-1
Matrix: Water

Method: 8015D - Diesel Range Organics (DRO) (GC)

Analyte	Result	Qualifier	RL		Unit	D	Prepared	Analyzed	Dil Fac
ORO (C22-C32)	0.21	Q9	0.20		mg/L		04/30/18 14:16	05/10/18 23:29	1
DRO (C10-C22)	ND	Q9	0.10		mg/L		04/30/18 14:16	05/10/18 23:29	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
o-Terphenyl (Surr)	*79*		*10 - 150*	*04/30/18 14:16*	*05/10/18 23:29*	*1*

Surrogate Summary

Client: Turner Laboratories, Inc.
Project/Site: 18D0619

TestAmerica Job ID: 550-101943-1

Method: 8015D - Diesel Range Organics (DRO) (GC)

Matrix: Water

Prep Type: Total/NA

		Percent Surrogate Recovery (Acceptance Limits)							
Lab Sample ID	Client Sample ID	OTPH (10-150)							
550-101943-1	18D0619-01	79							
LCS 550-145985/2-A	Lab Control Sample	79							
LCSD 550-145985/3-A	Lab Control Sample Dup	79							
MB 550-145985/1-A	Method Blank	65							

Surrogate Legend

OTPH = o-Terphenyl (Surr)

Method: 8015D - Diesel Range Organics (DRO) (GC)

Lab Sample ID: MB 550-145985/1-A
Matrix: Water
Analysis Batch: 146884

Client Sample ID: Method Blank
Prep Type: Total/NA
Prep Batch: 145985

Analyte	MB Result	MB Qualifier	RL		Unit	D	Prepared	Analyzed	Dil Fac
ORO (C22-C32)	ND		0.20		mg/L		04/30/18 14:15	05/11/18 11:16	1
DRO (C10-C22)	ND		0.10		mg/L		04/30/18 14:15	05/11/18 11:16	1

Surrogate	*MB %Recovery*	*MB Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
o-Terphenyl (Surr)	*65*		*10 - 150*	*04/30/18 14:15*	*05/11/18 11:16*	*1*

Lab Sample ID: LCS 550-145985/2-A
Matrix: Water
Analysis Batch: 146884

Client Sample ID: Lab Control Sample
Prep Type: Total/NA
Prep Batch: 145985

Analyte			Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits		
ORO (C22-C32)			1.60	1.59		mg/L		99	69 - 107		
DRO (C10-C22)			0.400	0.450		mg/L		113	42 - 133		

Surrogate	*LCS %Recovery*	*LCS Qualifier*	*Limits*
o-Terphenyl (Surr)	*79*		*10 - 150*

Lab Sample ID: LCSD 550-145985/3-A
Matrix: Water
Analysis Batch: 146884

Client Sample ID: Lab Control Sample Dup
Prep Type: Total/NA
Prep Batch: 145985

Analyte			Spike Added	LCSD Result	LCSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
ORO (C22-C32)			1.60	1.59		mg/L		100	69 - 107	0	20
DRO (C10-C22)			0.400	0.447		mg/L		112	42 - 133	1	22

Surrogate	*LCSD %Recovery*	*LCSD Qualifier*	*Limits*
o-Terphenyl (Surr)	*79*		*10 - 150*

QC Association Summary

Client: Turner Laboratories, Inc.
Project/Site: 18D0619

TestAmerica Job ID: 550-101943-1

GC Semi VOA

Prep Batch: 145985

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
550-101943-1	18D0619-01	Total/NA	Water	3510C	
MB 550-145985/1-A	Method Blank	Total/NA	Water	3510C	
LCS 550-145985/2-A	Lab Control Sample	Total/NA	Water	3510C	
LCSD 550-145985/3-A	Lab Control Sample Dup	Total/NA	Water	3510C	

Analysis Batch: 146884

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
550-101943-1	18D0619-01	Total/NA	Water	8015D	145985
MB 550-145985/1-A	Method Blank	Total/NA	Water	8015D	145985
LCS 550-145985/2-A	Lab Control Sample	Total/NA	Water	8015D	145985
LCSD 550-145985/3-A	Lab Control Sample Dup	Total/NA	Water	8015D	145985

Lab Chronicle

Client: Turner Laboratories, Inc.
Project/Site: 18D0619

TestAmerica Job ID: 550-101943-1

Client Sample ID: 18D0619-01
Date Collected: 04/23/18 15:55
Date Received: 04/27/18 10:50

Lab Sample ID: 550-101943-1
Matrix: Water

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	3510C			145985	04/30/18 14:16	REM	TAL PHX
Total/NA	Analysis	8015D		1	146884	05/10/18 23:29	TC1	TAL PHX

Laboratory References:

TAL PHX = TestAmerica Phoenix, 4625 East Cotton Ctr Blvd, Suite 189, Phoenix, AZ 85040, TEL (602)437-3340

Accreditation/Certification Summary

Client: Turner Laboratories, Inc.
Project/Site: 18D0619

TestAmerica Job ID: 550-101943-1

Laboratory: TestAmerica Phoenix

Unless otherwise noted, all analytes for this laboratory were covered under each accreditation/certification below.

Authority	Program	EPA Region	Identification Number	Expiration Date
Arizona	State Program	9	AZ0728	06-09-18

Analysis Method	Prep Method	Matrix	Analyte

Method Summary

Client: Turner Laboratories, Inc.
Project/Site: 18D0619

TestAmerica Job ID: 550-101943-1

Method	Method Description	Protocol	Laboratory
8015D	Diesel Range Organics (DRO) (GC)	SW846	TAL PHX
3510C	Liquid-Liquid Extraction (Separatory Funnel)	SW846	TAL PHX

Protocol References:

SW846 = "Test Methods For Evaluating Solid Waste, Physical/Chemical Methods", Third Edition, November 1986 And Its Updates.

Laboratory References:

TAL PHX = TestAmerica Phoenix, 4625 East Cotton Ctr Blvd, Suite 189, Phoenix, AZ 85040, TEL (602)437-3340

SUBCONTRACT ORDER

Turner Laboratories, Inc.

101943

18D0619

SENDING LABORATORY:	RECEIVING LABORATORY:
Turner Laboratories, Inc.	TestAmerica Phoenix
2445 N. Coyote Drive, Ste #104	4625 East Cotton Center Boulevard Suite 189
Tucson, AZ 85745	Phoenix, AZ 85540
Phone: 520.882.5880	Phone :(602) 437-3340
Fax: 520.882.9788	Fax:
Project Manager: Kevin Brim	Please CC Kevin Brim Kbrim@turnerlabs.com

Analysis	Expires	Laboratory ID	Comments
-01			
Sample ID: 18D0619-01 Drinking Water	**Sampled:04/23/2018 15:55**		
8015D Sub	04/30/2018 15:55		8015D DRO and ORO Paramaters Only
Containers Supplied:			

8015D Sub
o-Terphenyl
C10-C32 (Total)
C22-C32 (Oil Range Organics)
C10-C22 (Diesel Range Organics)
C6-C10 (Gasoline Range Organics)

550-101943 Chain of Custody

3,8°C UPS GR

TA-PHX

Released By	Date	Received By	Date
	4/24/18		4-27-18 1050
Released By	Date	Received By	Date

Login Sample Receipt Checklist

Client: Turner Laboratories, Inc.

Job Number: 550-101943-1

Login Number: 101943
List Number: 1
Creator: Gravlin, Andrea

List Source: TestAmerica Phoenix

Question	Answer	Comment
Radioactivity wasn't checked or is </= background as measured by a survey meter.	True	
The cooler's custody seal, if present, is intact.	True	
Sample custody seals, if present, are intact.	True	
The cooler or samples do not appear to have been compromised or tampered with.	True	
Samples were received on ice.	True	
Cooler Temperature is acceptable.	True	
Cooler Temperature is recorded.	True	
COC is present.	True	
COC is filled out in ink and legible.	True	
COC is filled out with all pertinent information.	True	
Is the Field Sampler's name present on COC?	True	
There are no discrepancies between the containers received and the COC.	True	
Samples are received within Holding Time (excluding tests with immediate HTs)	True	
Sample containers have legible labels.	True	
Containers are not broken or leaking.	True	
Sample collection date/times are provided.	True	
Appropriate sample containers are used.	True	
Sample bottles are completely filled.	True	
Sample Preservation Verified.	True	
There is sufficient vol. for all requested analyses, incl. any requested MS/MSDs	True	
Containers requiring zero headspace have no headspace or bubble is <6mm (1/4").	True	
Multiphasic samples are not present.	True	
Samples do not require splitting or compositing.	True	
Residual Chlorine Checked.	False	Check done at department level as required.

Radiation Safety Engineering, Inc.
3245 N. WASHINGTON ST. • CHANDLER, ARIZONA 85225-1121 (480) 897-9459
Website: www.radsafe.com FAX (480) 892-5446

Radiochemical Activity in Water (pCi/L)

Turner Laboratories
2445 N. Coyote Drive, Ste. 104
Tucson, AZ 85745

Sampling Date: April 23, 2018
Sample Received: May 01, 2018
Analysis Completed: May 22, 2018

Sample ID	Gross Alpha Activity Method 600/00-02 (pCi/L)	Uranium Activity Method ASTM D6239 (pCi/L)	Adjusted Gross Alpha (pCi/L)	Radium 226 Activity Method GammaRay HPGE (pCi/L)	Radium 228 Activity Method GammaRay HPGE (pCi/L)	Total Radium (pCi/L)
18D0619-01	17.7 ± 0.9	12.9 ± 1.2	4.8 ± 1.5	3.1 ± 0.3	3.1 ± 0.4	6.2 ± 0.5
Date of Analysis	5/2/2018	5/21/2018	5/21/2018	5/4/2018	5/4/2018	5/4/2018

Robert L. Metzger, Ph.D., C.H.P. 5/22/2018
Laboratory License Number AZ0462 Date

Radiation Safety Engineering, Inc.
3245 N. WASHINGTON ST. • CHANDLER, ARIZONA 85225-1121 (480) 897-9459
Website: www.radsafe.com FAX (480) 892-5446

Isotopic Uranium Analysis

Turner Laboratories
2445 N. Coyote Drive, Ste. 104
Tucson, AZ 85745

Sampling Date: April 23, 2018
Sample Received: May 01, 2018
Uranium Analysis Date: May 21, 2018

Sample No.	^{238}U	^{235}U	^{234}U	Total	
18D0619-01	6.0 ± 0.6	0.280 ± 0.004	6.6 ± 0.6	12.9 ± 1.2	Activity (pCi/L)
	17.9 ± 1.7	0.131 ± 0.002	0.00106 ± 0.00010	18.0 ± 1.7	Content (µg/L)
	Comments:				

Robert L. Metzger, Ph.D., C.H.P. 5/22/2018
Date

Laboratory License Number AZ0462

Arizona Department of Environmental Quality

Drinking Water Radionuclides-Adjusted Gross Alpha, Radium 226 & 228, Uranium Analysis Report

Samples To Be Taken At Entry Point Into Distribution System (EPDS) Only

PWS ID#: AZ04 _____ PWS Name: _____

April 23, 2018 (Sample Date) 15:55 (Sample Time) (24 hour clock) _____ (Owner/Contact Person)

_____ (Owner/Contact Fax Number) _____ (Owner/Contact Phone Number)

Sample Collection Point

☐ EPDS # _____

Compliance Sample Type:

☐ Reduced Monitoring — Date Q1 collected: _____

☐ Quarterly — Date Q2 collected: _____

☐ Composite of four quarterly samples — Date Q3 collected: _____

Date Q4 collected: _____

*****RADIOCHEMICAL ANALYSIS*****

>>>To be filled out by laboratory personnel<<<

*****Combined Uranium must be reported in micrograms per liter*****

Analysis Method	MCL	Reporting Limit	Contaminant Name	Cont. Code	Analyses Run Date	Result		Exceed MCL
	15 pCi/L		Adjusted Gross Alpha	4000	5/21/2018	4.8 ± 1.5		
600/00-02		3 pCi/L	Gross Alpha	4002	5/2/2018	17.7 ± 0.9		
7500 - Rn			Radon	4004				
ASTM D6239	30 µg/L	1 µg/L	Combined Uranium	4006	5/21/2018	18.0 ± 1.7	µg/L	
			Uranium 234	4007	5/21/2018	0.00106 ± 0.00010		
			Uranium 235	4008	5/21/2018	0.131 ± 0.002		
			Uranium 238	4009	5/21/2018	17.9 ± 1.7		
	5 pCi/L	1 pCi/L	Combined Radium (226,228)	4010	5/4/2018	6.2 ± 0.5		X
GammaRay HPGE		1 pCi/L	Radium 226	4020	5/4/2018	3.1 ± 0.3		
GammaRay HPGE		1 pCi/L	Radium 228	4030	5/4/2018	3.1 ± 0.4		

*****LABORATORY INFORMATION*****

>>>To be filled out by laboratory personnel<<<

Specimen Number: RSE60312

Lab ID Number: AZ0462

Lab Name: Radiation Safety Engineering, Inc.

Printed Name and Phone Number of Laboratory Contact: Robert L. Metzger, Ph.D., C.H.P. (480) 897-9459

Comments: 18D0619-01

Authorized Signature: Robt L. Metzger

Date Public Water System Notified: _____

DWAR 6: 11/2007

SUBCONTRACT ORDER

Turner Laboratories, Inc.

18D0619

SENDING LABORATORY:

Turner Laboratories, Inc.
2445 N. Coyote Drive, Ste #104
Tucson, AZ 85745
Phone: 520.882.5880
Fax: 520.882.9788
Project Manager: Kevin Brim

RECEIVING LABORATORY:

Radiation Safety Engineering, Inc.
3245 N. Washington St.
Chandler, AZ 85225-1121
Phone :(480) 897-9459
Fax: (480) 892-5446
Please CC Kevin Brim Kbrim@turnerlabs.com

Analysis	Expires	Laboratory ID	Comments
Sample ID: 18D0619-01 Drinking Water Sampled:04/23/2018 15:55			
Radiochemistry, Gross Alpha	10/20/2018 15:55		Analyze Uranium and Adjusted Alpha if G. Alpha is > 12
Radiochemistry, Radium 226/228	05/23/2018 15:55		
Containers Supplied:			

H 60312

Released By	Date	Received By	Date
[signature]	4/30/18 16:00	UPS	4/30/18 16:00
Released By	Date	Received By	Date

APPENDIX D

Well Completion Documentation

PIPE TALLY

Project Name.: FCI PTF	Project No.: 127687-009
Well No.: I-03 ZS R-05	Date: 11/29/17
Location: Furnace	Pipe Talley for: Overburden
Total Depth: 500'	Geologist: S. Henkel

Type of Connections: ☒ Welded ☐ T+C ☐ Flush Thread ☐ Other

Pipe	✓	Length (ft)	Length Σ (ft)	Pipe Type	Dist. from sensor bottom to bottom of pipe (feet)	Sensor Type (ACD, CS, ERT)	Sensor ID	Wire Lead ID	Depth of Sensor (feet bgs)
1	✓	2.14	2.14	Grout shoe					
2	✓	40.3	42.44	LCS - Fusion Bond					
3	✓	40.1	82.54	LCS					
4	✓	40.09	122.63						
5	✓	40.03	162.66						
6	✓	40.02	202.68						
7	✓	40.08	242.76						
8	✓	40.04	282.8						
9	✓	40.06	322.86						
10	✓	40.08	362.94						
11	✓	40.02	402.96						
12	✓	40.02	442.98						
13	✓	40.08	483.06						
14	✓	12.70	495.76						
15	✓	17.7	513.46						

Notes:
LCS - Low Carbon Steel
14" OD 0.312 wall thickness
Fusion bond - polyethylene
Centralizers every 40' starting at bottom of pipe 3
Casing stickup before cutoff = 811.28'

SUMMARY OF TALLY	
Total Length tallied:	~~495.76~~ 513.46
Casing Stick-Up:	1.45 ft
Length of Casing Cut-Off:	9.33 ft
Bottom of Well:	502.18 ft
Screened Interval:	—
Total Screen in Hole:	—

Sensor Types: Annular Conductivity Device (ACD), installed as pairs with 3 ft spacing
Conductivity Sensor (CS) 4 sensors with sing lead 20 ft spacing
Electrical Resistivity Tomography (ERT)

HALEY ALDRICH

HALEY ALDRICH

ESTIMATED ANNULAR MATERIAL RECORD

Project Name: FCI PTF **Project #.:** 129697-007 **Date:** 11/29/17
Well No.: R-05 **Geologist:** S. Hengel

ANNULAR VOLUME CALCULATIONS

Total Depth of Borehole [T]:	504	feet	Total Cased Depth:	502.18	feet
Borehole Diameter [D]:	20	inches	Rat Hole Volume [R=(D^2) 0.005454*L_r]:	4.1	Ft^3
Screen Length [L_s]:	–	feet	Rat Hole Length [L_r]	1.82	feet
Screen Diameter [d_s]:	–	inches	Camera Tube Length [L_{ct}]	–	feet
Casing Length [L_c]	502.18	feet	Camera Tube Diameter [d_{ct}]	–	inches
Casing Diameter [d_c]	14	inches			

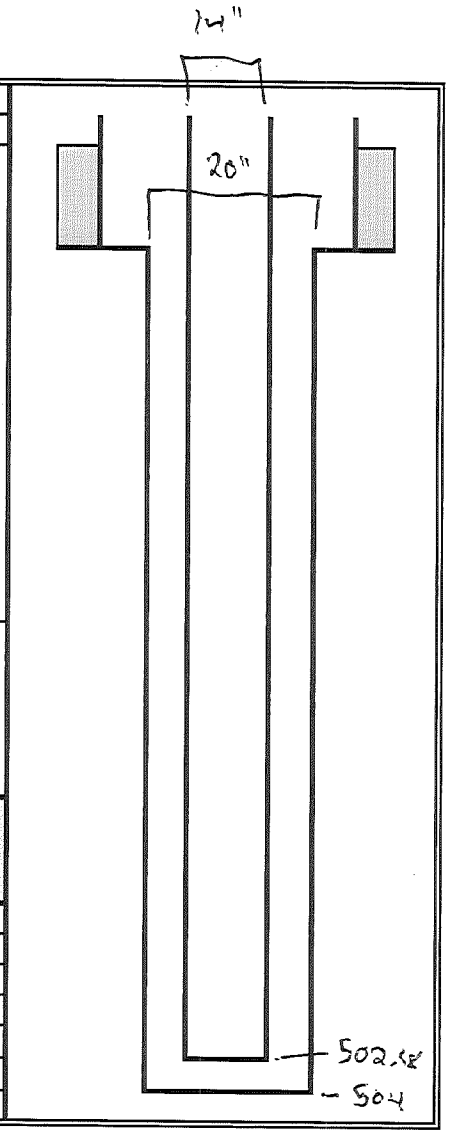
Screen Annular Volume (A_s): (D^2-d_s^2) 0.005454 = – Ft^3/Lin. Ft
Casing Annular Volume (A_c): (D^2-d_c^2) 0.005454 = 1.11 Ft^3/Lin. Ft
Casing/Cam.Tube Annular Volume (A_{c+ct}): (D^2-d_c^2-d_{ct}^2) 0.005454 = – Ft^3/Lin. Ft

EQUATIONS

2,700 lbs. Silica Sand = 1 cubic yard = 27 cubic feet
[1] Volume of bag (Ft^3) = bag weight/100
[2] Calculated depth = Previous Calculated depth - (v/A)

Bentonite Sack = 0.69 ft^3
Silica Sand Super Sack = 3000 lbs.

No.	✓	Weight of Bag (lbs.)	Volume of Bag[1] (v) (ft^3)	Total Vol. of Bags (ft^3)	Calculated Depth[2] (ft bls)	Tagged Depth (ft bls)	Comments
1	✓	–	5334	133	± – 79.7	Surface	Type V (Next Cement)
							average 14.2 lb/gal



$(20^2 - 14)0.005454 = 1.11\ ft^3/ln\ ft$

115% of calculated volume

HALEY ALDRICH

PIPE TALLY

Project Name.: ELT PTF	Project No.: 129687-007
Well No.: R-05	Date: 2/3/18
Location: Florence AZ	Pipe Talley for: Lowar
Total Depth:	Geologist: S Hensel

Type of Connections: ☐ Welded ☐ T+C ☑ Flush Thread ☐ Other

Pipe	✓	Length (ft)	Length Σ (ft)	Pipe Type	Dist. from sensor bottom to bottom of pipe (feet)	Sensor Type (ACD, CS, ERT)	Sensor ID	Wire Lead ID	Depth of Sensor (feet bgs)
1	↘	0.36	0.36	S.S. End cap					
2	↘	20.03	20.39	Sch 80 PVC Screen	10.49	ERT	12 ~~31~~		
3	☆	20.04	40.43		10.49	ERT	12		1170.00
4	↘	20.02	60.45						
5	☆	20.02	80.47						
6	↘	20.03	100.50		15.42	ERT	11		1104.97
7	☆	20.04	120.54						
8	↘	20.04	140.58						
9	☆	20.02	160.60						
10	↘	20.03	180.63		0.48	ERT	10		1039.78
11	☆	20.03	200.66						
12	↘	19.99	220.65						
13	☆	19.99	240.64		5.48	ERT	9		974.73
14	↘	20.01	260.65						
15	☆	20.02	280.67						
16	↘	20.03	300.70	↓	10.44	ERT	8		909.75
17	☆	20.02	320.72	Sch 80 PVC Blank					
18	↘	20.03	340.75	Sch 80 PVC Screen					
19	☆	19.96	360.71		15.52	ERT	7		844.59
20	↘	20.01	380.72						
21	☆	20.02	400.74						
22	↘	20.01	420.75						
23	☆*	20.01	440.76		0.48	ERT	6		779.63
24	↘	20.01	460.77						
25	☆	20.00	480.77						
26	↘	20.01	500.78		5.48	ERT	5		714.61
27	☆	20.01	520.79						
28	↘	20.01	540.80	↓					
29	☆	20.01	560.81	Sch 80 PVC Blank	10.45	ERT	4		649.61
30	↘	20.01	580.82	Sch 80 PVC Screen	5.05	Transducer	N		635.00

Notes:

☆ - Centralizer
*☆ - Centralizer relocated due to sensor

SUMMARY OF TALLY	
Total Length tallied:	~~1203.44~~ 1203.80
Casing Stick-Up:	
Length of Casing Cut-Off:	
Bottom of Well:	
Screened Interval:	
Total Screen in Hole:	

Sensor Types: Annular Conductivity Device (ACD), installed as pairs with 3 ft spacing
Conductivity Sensor (CS) 4 sensors with sing lead 20 ft spacing
Electrical Resistivity Tomography (ERT)

HALEY ALDRICH

1st Sensor: 1170' 10.49' from bottom of pipe 3
Transducer = 635' 5.05' fro bottom of pipe 30 (top of transducer)

HALEY ALDRICH

PIPE TALLY

Project Name.: SCI PTF	Project No.: 129687-009
Well No.: R-05	Date: 2/3/14
Location: Florence, AZ	Pipe Talley for: Lower
Total Depth:	Geologist: S Hengel

Type of Connections: ☐ Welded ☒ T+C ☒ Flush Thread ☐ Other

~~490.83~~ ~~21.855~~

Pipe	✓	Length (ft)	Length Σ (ft)	Pipe Type	Dist. from sensor bottom to bottom of pipe (feet)	Sensor Type (ACD, CS, ERT)	Sensor ID	Wire Lead ID	Depth of Sensor (feet bgs)
31	☆	20.00	600.82	Sch 80 PVC Screen					
32	✓	20.01	620.83	↓	15.46	ERT	3		584.58
33	☆	20.01	640.84	↓					
34	✓	20.01	660.85	↓					
35	☆	20.01	680.86	↓					
36	✓	0.5	681.36	PVC to fiberglass adapter					
37	☆	29 ~~20.01~~	710.37	Fiberglass	0.02	ERT	2		519.03
38	☆	29 ~~20.01~~	739.37	↓					
39	☆	29.01	768.38	↓	7.125	ERT	1		569.92 (MH)
40	✓	29.00	797.38	↓					
41	☆	29.01	826.39	↓					
42	☆	29.06	855.45	↓					
43	✓	29.08	884.53	↓					
44	☆	29.10	913.69	↓					
45	☆	29.06	~~942.85~~	942.75					
46	✓	29.06	~~971.91~~	971.81					
47	☆	29.06	~~1000.97~~	1000.87					
48	☆	29.03	~~1029.90~~	1030.00					
49	✓	28.90	~~1058.90~~	1058.80					
50	☆	28.93	~~1087.83~~	1087.83					
51	☆	28.93	~~1116.60~~	1116.86					
52	✓	29.00	~~1145.66~~	1145.76					
53	☆	29.07	~~1174.73~~	1174.83					
54	☆	29.07	~~1203.78~~	↓ 1203.8					
~~55~~									

Margin: 29.01 / 29.00

Notes:

☆ - centralizer

SUMMARY OF TALLY

Total Length tallied:	~~1203.74~~ 1203.80
Casing Stick-Up:	
Length of Casing Cut-Off:	
Bottom of Well:	
Screened Interval:	
Total Screen in Hole:	

Sensor Types: Annular Conductivity Device (ACD), installed as pairs with 3 ft spacing
Conductivity Sensor (CS) 4 sensors with sing lead 20 ft spacing
Electrical Resistivity Tomography (ERT)

HALEY ALDRICH

HALEY ALDRICH

Casing Layout

Project Name.:	Florence Copper INC	**Project No.:**	129687-007
Well No.:	~~R-04~~ R-05	**Date:**	2/3/18
Location:	Florence AZ	**Layout for:**	Lower
Total Depth:		**Geologist:**	M. Hensman

Pipe Length		Depth BGS
		761.06
20.01	23	781.07
20.01	22	801.08
20.02	21	821.10
20.01	20	841.11
19.96	19	861.07
20.03	18	881.10
20.02	17	901.12
20.03	16	921.15
20.02	15	941.17
20.01	14	961.18
19.99	13	981.17
19.99	12	1001.16
20.03	11	1021.19
20.03	10	1041.22
20.02	9	1061.24
20.04	8	1081.28
20.04	7	1101.32
20.03	6	1121.35
20.02	5	1141.37
20.02	4	1161.39
20.04	3	1181.43
20.03	2	1201.46
0.36	1	1201.82

Pipe Length		Depth BGS
		230.01
29.06	46	259.07
29.06	45	288.13
29.16	44	317.29
29.08	43	346.37
29.06	42	375.43
29.01	41	404.44
29.00	40	433.44
29.01	39	462.45
29.00	38	491.45
29.01	37	520.46
0.50	36	520.96
20.01	35	540.97
20.01	34	560.98
20.01	33	580.99
20.01	32	601.00
20.00	31	621.00
20.01	30	641.01
20.01	29	661.02
20.01	28	681.03
20.01	27	701.04
20.01	26	721.05
20.00	25	741.05
20.01	24	761.06

Pipe Length		Depth BGS
	69	
	68	
	67	
	66	
	65	
	64	
	63	
	62	
	61	
	60	
	59	
	58	
	57	
	56	-6.28
4.30	55	-1.98
29.07	54	27.09
29.07	53	56.16
29.00	52	85.16
28.93	51	114.09
28.93	50	143.02
28.90	49	171.92
29.03	48	200.95
29.06	47	230.01

SENSOR DETAILS

Sensor Type	Sensor ID	Pipe #	Distance from Bottom of Sensor to Bottom of Pipe	Depth of Sensor (BGS)
ERT	12	3	10.47	1170.96
ERT	11	6	15.42	1105.93
ERT	10	10	0.48	1040.74
ERT	9	13	5.48	975.69
ERT	8	16	10.44	910.71
ERT	7	19	15.52	845.55
ERT	6	23	0.48	780.59
ERT	5	26	5.48	715.57
ERT	4	29	10.45	650.57
ERT	3	32	15.46	585.54
ERT	2	37	0.02	520.49
ERT	1		7.13	569.92
Trans	1	38	5.05	

Pipe Number	Type
1	SS End Cap
2-16	PVC SCH 80 Screen 0.080
17	PVC SCH 80 Blank
18-28	PVC SCH 80 Screen 0.080
29	PVC SCH 80 Blank
30-35	PVC SCH 80 Screen 0.080
36	SS PVC-fiberglass Transition
37-54	Fiberglass

NOTES: Gate Target stickup w/ coupler 1.64

HALEY ALDRICH

Casing Layout

Project Name.:	Florence Copper INC	**Project No.:**	129687-007
Well No.:	R-05	**Date:**	2.3.18
Location:	Florence AZ	**Layout for:**	Well Casing Install
Total Depth:	1201.82	**Geologist:**	S. Hensel

Pipe Length		Depth BGS
		761.06
20.01	23	781.07
20.01	22	801.08
20.02	21	821.10
20.01	20	841.11
19.96	19	861.07
20.03	18	881.10
20.02	17	901.12
20.03	16	921.15
20.02	15	941.17
20.01	14	961.18
19.99	13	981.17
19.99	12	1001.16
20.03	11	1021.19
20.03	10	1041.22
20.02	9	1061.24
20.04	8	1081.28
20.04	7	1101.32
20.03	6	1121.35
20.02	5	1141.37
20.02	4	1161.39
20.04	3	1181.43
20.03	2	1201.46
0.36	1	1201.82

Pipe Length		Depth BGS
		230.01
29.06	46	259.07
29.06	45	288.13
29.16	44	317.29
29.08	43	346.37
29.06	42	375.43
29.01	41	404.44
29.00	40	433.44
29.01	39	462.45
29.00	38	491.45
29.01	37	520.46
0.50	36	520.96
20.01	35	540.97
20.01	34	560.98
20.01	33	580.99
20.01	32	601.00
20.00	31	621.00
20.01	30	641.01
20.01	29	661.02
20.01	28	681.03
20.01	27	701.04
20.01	26	721.05
20.00	25	741.05
20.01	24	761.06

Pipe Length		Depth BGS
	69	
	68	
	67	
	66	
	65	
	64	
	63	
	62	
	61	
	60	
	59	
	58	
	57	
	56	
	55	-1.98
29.07	54	27.09
29.07	53	56.16
29.00	52	85.16
28.93	51	114.09
28.93	50	143.02
28.90	49	171.92
29.03	48	200.95
29.06	47	230.01

SENSOR DETAILS

Sensor Type	Sensor ID	Pipe #	Distance from Bottom of Sensor to Bottom of Pipe	Depth of Sensor (BGS)
ERT	12	3	10.47	1170.96
ERT	11	6	15.42	1105.93
ERT	10	10	0.48	1040.74
ERT	9	13	5.48	975.69
ERT	8	16	10.44	910.71
ERT	7	19	15.52	845.55
ERT	6	23	0.48	780.59
ERT	5	26	5.48	715.57
ERT	4	29	10.45	650.57
ERT	3	32	15.46	585.54
ERT	2	37	0.02	520.44
ERT	1	39	7.13	455.33
Trans		30	5.05	635.96
				#REF!
				#REF!
				#REF!

Pipe Number	Type
1	SS End Cap
2 -16	PVC SCH 80 Screen 0.020
17	PVC SCH 80 Blank
18-28	PVC SCH 80 Screen 0.020
29	PVC SCH 80 Blank
30-35	PVC SCH 80 Screen 0.020
36	PVC/FRP Adaptor
36-54	FRP

Notes:

HALEY ALDRICH

Pg. 1 of

ESTIMATED ANNULAR MATERIAL RECORD (Continued)

Project Name: FCI-PTF **Project No.:** 129687-007 **Geologist:** S Hensel
Well No.: R-05 **Date:** 2/3/18

No.	✓	Weight of Bag (lbs.)	Volume of Bag[1] (v) (ft³)	Total Vol. of Bags (ft³)	Calculated Depth[2] * (ft bls)	Tagged Depth (ft bls)	Comments	Tremie
1	✓	3000	30	30	1175	1183	S.S. #1, #6 gravel	1170
2	✓	3000	30	60	1143	–	S.S. #2, #6 gravel	1141
3	✓	3000	30	90	1106	–	S.S. #3, #6 gravel	1109
4	✓	3000	30	120	1072	–	S.S. #4, #6 gravel	1177
5	✓	3000	30	150	1051	1043	S.S. #5, #6 gravel	1046
6	✓	3000	30	180	1025	– unsure of tag	S.S. #6, #6 gravel	1014
7	✓	3000	30	210	986	–	S.S. #7, #6 gravel	994
8	✓	3000	30	240	961	960	S.S. #8, #6 gravel	922
9	✓	3000	30	270	944	913	S.S. #9, #6 gravel	922/890
10	–	–	–	–	–	924	swab 1200-1100' 15 min	890
11	–	–	–	–	–	929.5	Swab 1200-1100' 10 min	"
12	–	–	–	–	–	932	swab 1100-1000 15 min	"
13	–	–	–	–	–	933	swab 1100-1000 10 min	"
14	–	–	–	–	–	933	swab 1100-1000 10 min	"
15		1500	15	285	918	~~918~~ 917 SH	1/2 S.S. #10, #6 gravel (917 w/o stickup)	"
16		1500	15	300	894	897	1/2 #6 gravel	"
17		—	—	—	—	901	Swab 1000-900 15 min	"
18		—	—	—	—	902	swab 1000-900 10 min	"
19		~~66.67~~ SH	~~.67~~	~~306~~ 304	896	895	Adding 6 buckets of #6 gravel	"
20		50	—	—	896	895	Swab 1000-900 10 min	
21		~~66.67~~ SH	0.5 ~~.67~~ SH	~~318~~ 308.5	886	888	Add 9 bag #60 sand, pulling 1 joint tremie ~~tremie @ 880~~	
22		~~66.67~~ SH	0.5 ~~.67~~ SH	~~318~~ 310	885	887	Add 3 bag #60 sand	

tremie @ 883

Notes:

304+6+2

Total depth of Borehole = 1212' (logger depth)
Borehole diameter = 12.25"
Screen length = –
Screen diameter = 5.56"
Casing length = –
Casing diameter = 5.44"

Total cased depth = ~~1203.80~~' SH 1201.82'
Rat hole volume = ~~6.7~~ ft³ SH
Rat hole length = ~~8.78~~' 10.18' (used logger depth)
Screen annular volume = 0.65
Casing annular volume = 0.64

*calculated depth estimated by using caliper

HALEY ALDRICH

ESTIMATED ANNULAR MATERIAL RECORD (Continued)

Project Name: Florence Copper Inc **Project No.:** 129687-007 **Geologist:** ~~M. Henneman~~ S. Hengel
Well No.: R-05 **Date:** 2/4/18

No.	✓	Weight of Bag (lbs.) SH 50	Volume of Bag[1] (v) (ft³) 0.5	Total Vol. of Bags SH (ft³)	Calculated Depth[2]* (ft bls)	Tagged Depth (ft bls)	Comments	Tremmie
23	✓	~~66.67~~	SH ~~.67~~	~~315~~ 312	885	883	Add 4 #60 sand bags ~~tremie~~ @ (MH) Polling tremie ~~855~~ 827	
24	✓	3000	30	SH ~~345~~ 342	839	824	Add 1 #6 gravel bag + pulled joint → Tremie @ → 765 after pulling 1 more	
25	✓	3000	30	SH ~~375~~ 372	778	744	Add 1 #6 bag pulling 2 joints → 701 tremie	
26	✓	2000	30	402	718	–	S.S. #13 #6 gravel	701
27	✓	1500	15	417	704	690	S.S. #14, #6 gravel 1/2	670
28	✓	1500	15	432	676	–	S.S. #14, #6 gravel 1/2	639
29	–	–	–	–	–	690	Swab 880-770 15 min	639
30	–	–	–	–	–	691	Swab 880-770 10 min	"
31	–	–	–	–	–	691	Swab 880-770 10 min	"
32	✓	1500	15	447	677	681	S.S. #15, #6 gravel 1/2	"
33	✓	1500	15	462	669	671	S.S. #16, #6 gravel 1/2	"
34	✓	2000	20	482	660	654	S.S. #17, #6 gravel 2/3	"
35	–	–	–	–	–	657	Swab 770-660 15 min	"
36	–	–	–	– 483.34	–	657	Swab 770-660 10 min	"
37	✓	66.67	0.67	~~482.67~~	656	656	5 gal bucket x2, #6 gravel	"
38	✓	50	0.5	488.34	649	654	#60 sand bag x10	"
39	✓	50	0.5	493.34	647	648.5	#60 sand bag ~~x10~~ ~~15~~ x13	"
40	✓	50	0.5	494.84	646	646	#60 sand bag x3	"
41	✓	3000	30	524.84	~~604~~	–	S.S. #18, #6 gravel	608
42	✓	3000	30	554.84	602	598	S.S. #19, #6 gravel	608
43		3000	30	584.84	552	~~547~~	SS. #20 #6 gravel	516
44		3000	30	614.84	~~506~~ 501	~~[illegible]~~ 527	S.S. #21 #6 gravel, pulled joint	506

Notes:

Total depth of Borehole = 1212' (logger depth)
Borehole diameter = 12.25"
Screen length = __
Screen diameter = 5.56"
Casing length = __
Casing diameter = 5.44"

Total cased depth = 1201.82'
Rat hole volume =
Rat hole length = 10.18' (used logger depth)
Screen annular volume = 0.65
Casing annular volume = 0.64

* calculated depth estimated by - using caliper

K:\Templates\Field Forms\Well Inst & Testing Forms.xls

HALEY ALDRICH

ESTIMATED ANNULAR MATERIAL RECORD (Continued)

Project Name: Florence Copper Inc **Project No.:** 129687-007 **Geologist:** S. Henrel
Well No.: R-05 **Date:** 2/5/18

No.	✓	Weight of Bag (lbs.)	Volume of Bag[1] (v) (ft³)	Total Vol. of Bags (ft³)	Calculated Depth[2] (ft bls)	Tagged Depth (ft bls)	Comments	Tremie
~~22~~ 45		15000	15	630	560?	519	1/2 #6 gravel	506
~~22~~ 46		1500	15	645	510	—	1/2 #6 gravel	"
—		—	—	—	—	509	swab 640-520 15 min	
—		—	—	—	—	509	swab 640-520 10 min	
—		—	—	—		(HW)	1 bucket pell-plug	491
—		66.67	.67	645.67	499	505	10 buckets #60 sand	"
—		66.67	.67	646.34	499	~~497~~	12 buckets #60 sand	"
—		—	—	—	—	493	1 bucket pell-plug	"
47	✓	— 443		1089.34	@ -9.54	0	Grout type V	484

Notes:

HALEY ALDRICH

CEMEX

58776432

R-05

Plant:	Begin Loading:	To Job:	Arrive Job:	Start Unload:	Finish Unload:	Leave Job:	Return Plant:
D03/A103	1415						

Customer Code: Customer Name: Customer Job Number: Order Code / Date:

Project Code: Project Name: Project P.O. Number: Order P.O. Number:

Ticket Date: Delivery Address: Map Page: Map/Row/Column:

Delivery Instructions: Dispatcher:

Ticket Number:

Due On Job:	Slump:	Truck Number:	Driver Number:	Driver Name:	End Use:

LOAD QUANTITY	CUMULATIVE QUANTITY	ORDERED QUANTITY	MATERIAL CODE	PRODUCTION DESCRIPTION	UOM	UNIT PRICE	AMOUNT

☐ Cash ☐ Check ☐ Charge	Check # / Auth Code:	Signature of Driver Receiving Cash:	Cash Received:	Total COD Order Amount to Collect Without Standby Charges:

Comments:

WATER ADDED: _____ GAL YARDS IN DRUM: _____ WHEN ADDED.

_____ SIGNATURE

CURB LINE CROSSED AT OWNER'S/AGENT'S REQUEST:

_____ SIGNATURE

❑ LOAD WAS TESTED BY: _____

Notice: Our drivers will make every effort to place materials where the customer designates, but the Company assumes no responsibility for damages inside curb or property line. Customer agrees to the terms of sale and delivery and accepts concrete as is. Due to important factors which are out of our control after delivery, this Company will not accept any responsibility for the finished results. No credit for returned concrete. Buyers exceptions and claims shall be deemed waived unless made to us in writing within one business day after the receipt of materials.

SPECIAL TERMS: Any water added is at customers own risk. If water is added on job, concrete strength is no longer guaranteed. **WARNING**: Product may cause skin and/or eye irritation. **CAUTION**: Material may be hazardous to your safety and health. Please refer to the backside of this ticket for important safety handling information, and to the material safety data sheets for additional information.

AUTHORIZED SIGNATURE:

Ⓧ

68UNIVERSAL

INVOICE

42581878 41072684

BASIC ENERGY SERVICES

3451 LeTourneau
Gillette, WY 82718
307-682-5258

Cementing Ticket No. 1719 21362

Date	Customer Order No.		Sect.	Twp.	Range	Truck Called Out	On Location	Job Began	Job Completed
11-29-17						15:00	15:00	16:30	18:15

Owner: Florance Copper Mine
Contractor: Hydro Resources
Charge To: Hydro West
Mailing Address:
City:
State: 101561

Well No. & Form: R 05
Place: copper mine
County: Pinal
State: AZ

Depth of Well: 502
Depth of Job: 500
Casing (New / Used) Size: 14 3/4
Weight:
Size of Hole: 20 inch
Amt. and Kind of Cement: type 2/5
(Cement Left / In casing by) Request Necessity: 0 feet

Kind of Job: surface
Drillpipe:
Tubing: 2 7/8
(Rotary / Cable) Truck No.: 28983

Price Reference No.:
Price of Job: 2541
Second Stage:
Pump Truck Mileage: 3825
P.U. Mileage: 765
Other Charges:
Total Charges: 7,131.00

Remarks:
Safety meeting held
hook up hose to tubing
pump 10 bbls of h2o ahead
mix and pump 550 sks of type2/5
release if any pressure (no pressure well on vac)
unhook hose from tubing
wash up in cellar
released
THANK YOU

Cementer: Bryan — Lead Yield: 1.38 — Lead Wt.: 14.6 — Lead Water: 6.8 — SV: 150
Helper: Santiago Chavez — Tail Yield: — Tail Wt.: — Lead Water: — SV:
District: Gillette — State: Wy

The above job was done under supervision of the owner, operator, or his agent whose signature appears below.

Agent of contractor or operator

Sales Ticket for Materials Only

QUANTITY SACKS	BRAND AND TYPE	PRICE	TOTAL
16	Crew subsistance	500	8,000.00
8	Transportaton of cement	150	1,200.00
			0.00
			0.00
			0.00
			0.00
			0.00
			0.00
			0.00
			0.00
			0.00
			0.00
			0.00
Plugs			0.00

Equipment #	HRS				
28983	1.5	550	Handling & Dumping	2.44	1,342.00
84127	1		Mileage		0.00
			Sub Total		17,673.00
			Discount		
			Sales Tax		
			Total		

Signature of operator

92628838 41086000

BASIC ENERGY SERVICES

3451 LeTourneau
Gillette, WY 82718
307-682-5258

Cementing Ticket No. 1719 21373 B

Date	Customer Order No.		Sect.	Twp.	Range	Truck Called Out	On Location	Job Began	Job Completed
02-05-18						16:00	17:00	18:15	19:30

Owner	Contractor	Charge To
Florance Copper Mine	Hydro Resources	Hydro West

Mailing Address	City	State

Well No. & Form	Place	County	State
R 05	copper mine	Pinal	AZ

Depth of Well	Depth of Job	Casing (New / Used)	Size / Weight	Size of Hole / Amt. and Kind of Cement	Cement Left in casing by / Request Necessity
1223	497	New	5.5	14	0 feet

Kind of Job: production Well

Drillpipe / Tubing: 2 7/8 (Rotary / Cable) Truck No. 28983

Price Reference No.
Price of Job 1210
Second Stage
Pump Truck Mileage 3825
P.U. Mileage 765
Other Charges
Total Charges 5,800.00

Remarks
safety meeting held
rig up to tubing with hose and valve
pump 5 bbls to clear tubing
pump and mix 335 sks type 2/5 cement
displace .5 bbl thru mixer
rig down from tubing
wash up in cellar
good cement to surface
THANK YOU

Cementer Bryan Hammond Lead Yield 1.38 Lead Wt 14.6 Lead Water 6.8 SV 79

Helper Daniel Johnson Tail Yield Tail Wt Lead Water SV

District Gillette State Wy

The above job was done under supervision of the owner, operator, or his agent whose signature appears below.

Agent of contractor or operator

Sales Ticket for Materials Only

QUANTITY SACKS	BRAND AND TYPE	PRICE	TOTAL
16	Crew subsistance	500	8,000.00
12	Transportaton of cement	150	1,800.00
			0.00
			0.00
			0.00
	P.O. # 152614		0.00
			0.00
			0.00
			0.00
			0.00
			0.00
			0.00
			0.00
			0.00
Plugs			0.00

Equipment #	HRS				
28983	1.5	335	Handling & Dumping	2.44	817.40
84127	1		Mileage		0.00
			Sub Total		16,417.40
			Discount		
			Sales Tax		
			Total		

Signature of operator

APPENDIX E

Geophysical Logs

Southwest Exploration Services, LLC

borehole geophysics & video services

COMPANY	FLORENCE COPPER COMPANY
WELL ID	R-05
FIELD	FLORENCE COPPER
COUNTY	PINAL STATE ARIZONA

TYPE OF LOGS: E-LOG - NAT. GAMMA
MORE:
LOCATION

SEC TWP RGE

OTHER SERVICES
CALIPER
TEMP / FLUID COND.
SONIC
DEVIATION

PERMANENT DATUM	ELEVATION	K.B.
LOG MEAS. FROM	GROUND LEVEL ABOVE PERM. DATUM	D.F.
DRILLING MEAS. FROM	GROUND LEVEL	G.L.

DATE	11-29-17 / 02-02-18	TYPE FLUID IN HOLE	MUD
RUN No	1	MUD WEIGHT	N/A
TYPE LOG	E-LOG - NAT GAMMA	VISCOSITY	32 VIS
DEPTH-DRILLER	1223 FT	LEVEL	FULL
DEPTH-LOGGER	1212 FT	MAX. REC. TEMP.	26.7 C
BTM LOGGED INTERVAL	1212 FT	IMAGE ORIENTED TO:	N/A
TOP LOGGED INTERVAL	SURFACE	SAMPLE INTERVAL	0.2 FT
DRILLER / RIG#	HYDRO RESOURCES	LOGGING TRUCK	TRUCK #900 / #800
RECORDED BY / Logging Eng.	K. MITCHELL	TOOL STRING/SN	MSI E-LOG 40GRP SN 5613
WITNESSED BY	H&A - LAUREN C	LOG TIME:ON SITE/OFF SITE	8:30 AM

RUN	BOREHOLE RECORD			CASING RECORD			
NO.	BIT	FROM	TO	SIZE	WGT.	FROM	TO
1	?"	SURFACE	40 FT	24"	STEEL	SURFACE	40 FT
2	20"	40 FT	500 FT	14"	STEEL	SURFACE	500 FT
3	12 1/4"	500 FT	TOTAL DEPTH				

COMMENTS:

.

Tool Summary:

Date	11-29-17 / 02-02-18	**Date**	11-29-17 / 02-02-18	**Date**	11-29-17 / 02-02-18
Run No.	1	**Run No.**	2	**Run No.**	3
Tool Model	MSI E-LOG 40GRP	**Tool Model**	QL COMBO TOOL	**Tool Model**	2DVA / QL DVA
Tool SN	4790 / 5513	**Tool SN**	4183 / 5613	**Tool SN**	6002 / 142201
From	SURFACE	**From**	SURFACE	**From**	SURFACE
To	1200 FT	**To**	1200 FT	**To**	1200 FT
Recorded By	K. MITCHELL	**Recorded By**	K. MITCHELL	**Recorded By**	K. MITCHELL
Truck No	900 / 800	**Truck No**	900 / 800	**Truck No**	900 / 800
Operation Check	02-02-18	**Operation Check**	02-02-18	**Operation Check**	02-02-18
Calibration Check	02-02-18	**Calibration Check**	02-02-18	**Calibration Check**	N/A
Time Logged	8:00 AM	**Time Logged**	9:00 AM	**Time Logged**	10:00 AM

Date	11-29-17 / 02-02-18	**Date**		**Date**	
Run No.	4	**Run No.**	5	**Run No.**	6
Tool Model	MSI 60MM SONIC	**Tool Model**		**Tool Model**	
Tool SN	5050	**Tool SN**		**Tool SN**	
From	SURFACE	**From**		**From**	
To	1200 FT	**To**		**To**	
Recorded By	K. MITCHELL	**Recorded By**		**Recorded By**	
Truck No	900 / 800	**Truck No**		**Truck No**	
Operation Check	02-02-18	**Operation Check**		**Operation Check**	
Calibration Check	N/A	**Calibration Check**		**Calibration Check**	
Time Logged	11:00 AM	**Time Logged**		**Time Logged**	

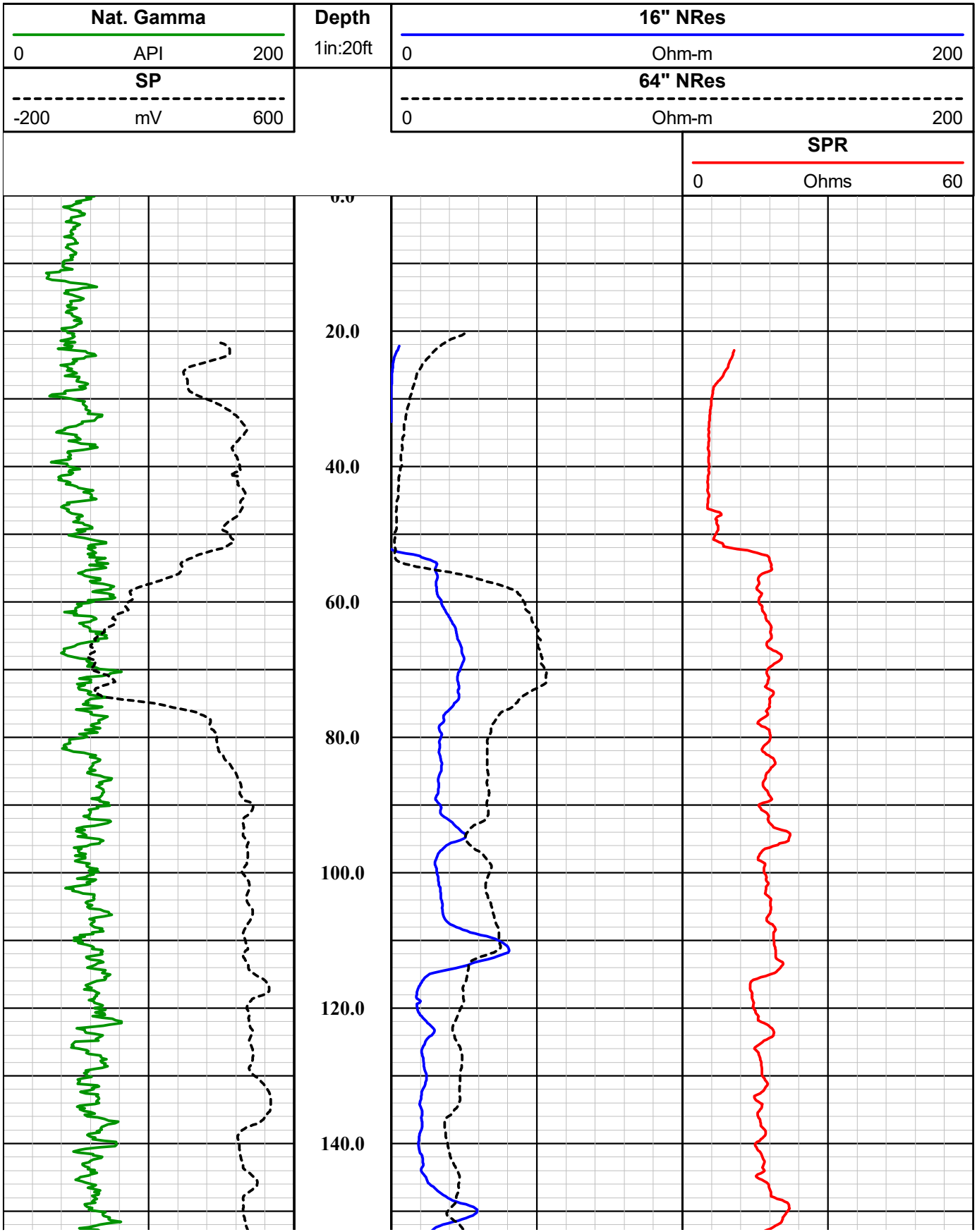
Additional Comments:

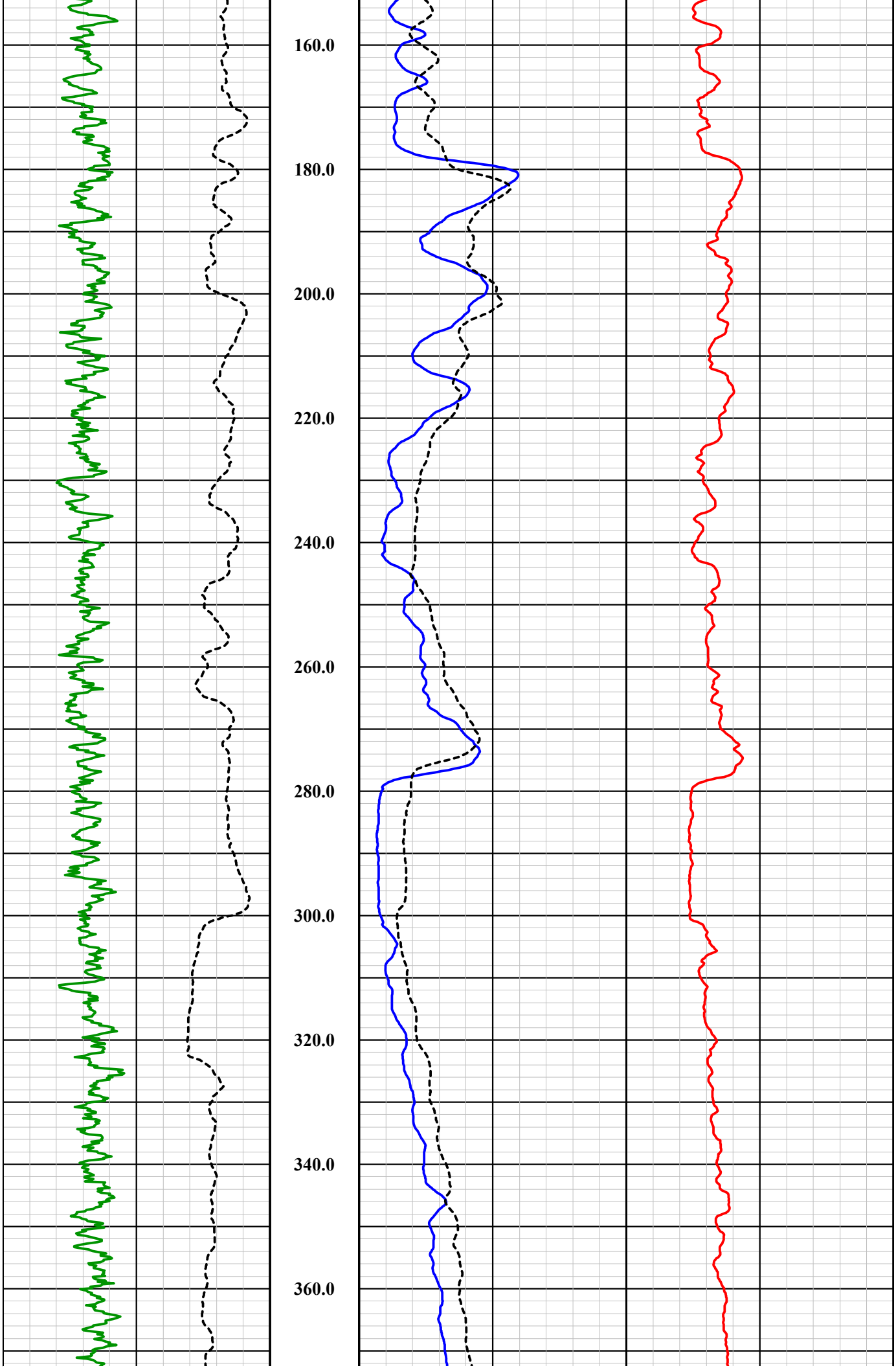
Caliper Arms Used: 16" **Calibration Points:** 10" & 21"

E-Log Calibration Range: 0 - 1,000 OHM-M **Calibration Points:** 1 & 1,000 OHM-M

Disclaimer:

All interpretations of log data are opinions based on inferences from electrical or other measurements. We do not guarantee the accuracy or correctness of any interpretations or recommendations and shall not be liable or responsible for any loss, costs, damages, or expenses incurred or sustained by anyone resulting from any interpretation made by any of our employees or agents. These interpretations are also subject to our general terms and conditions set out in our current Service Invoice.

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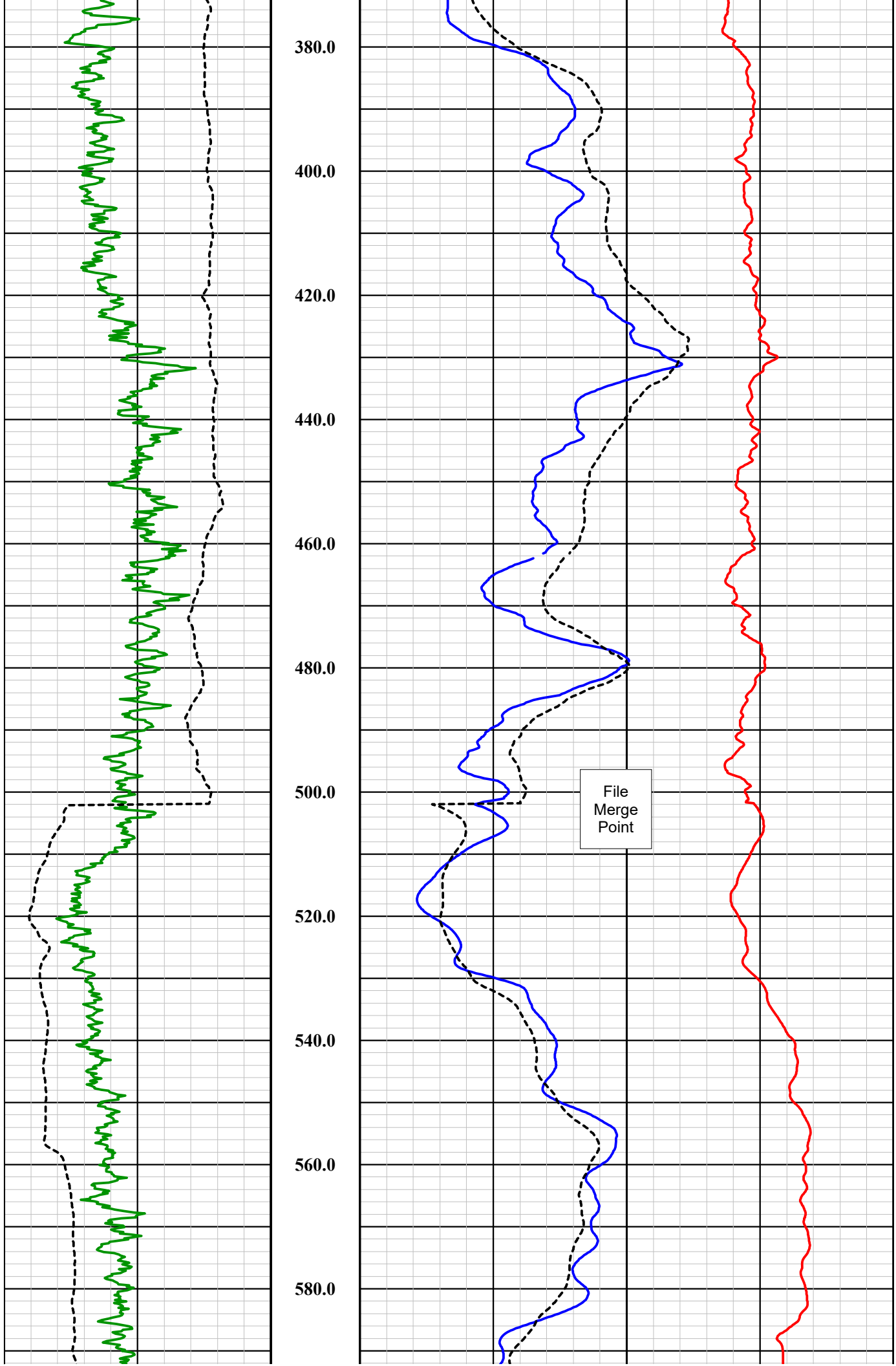
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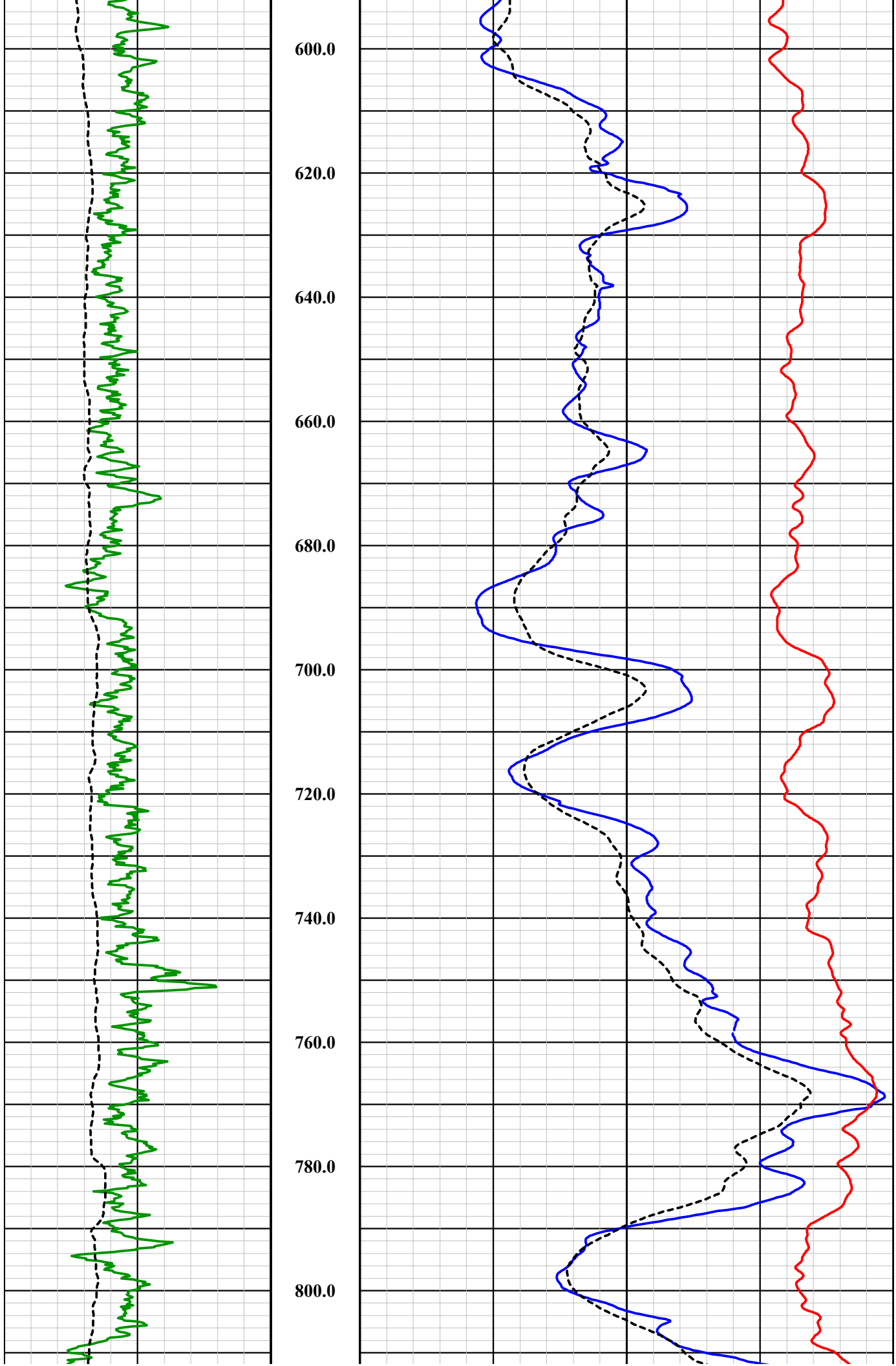
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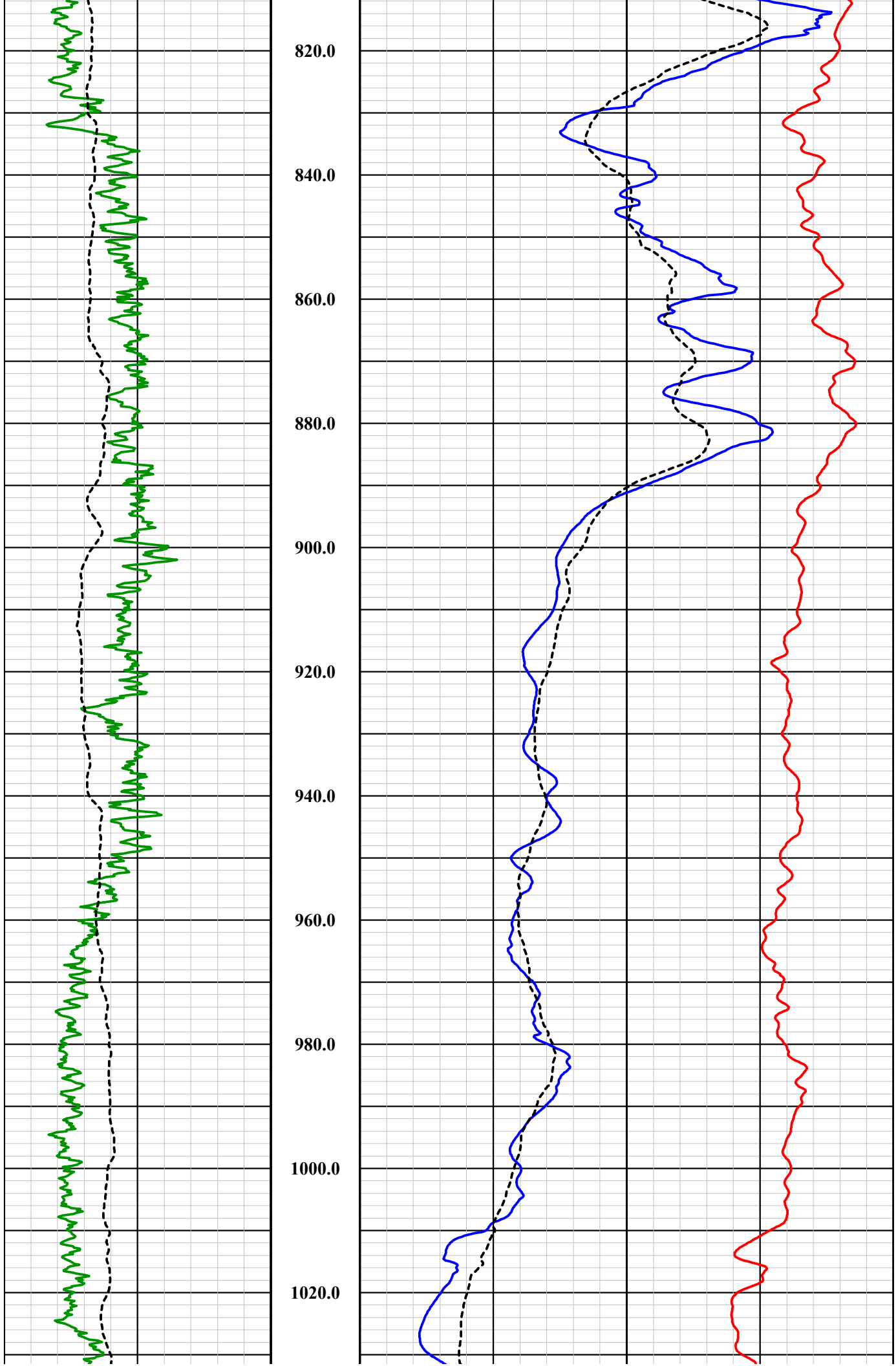
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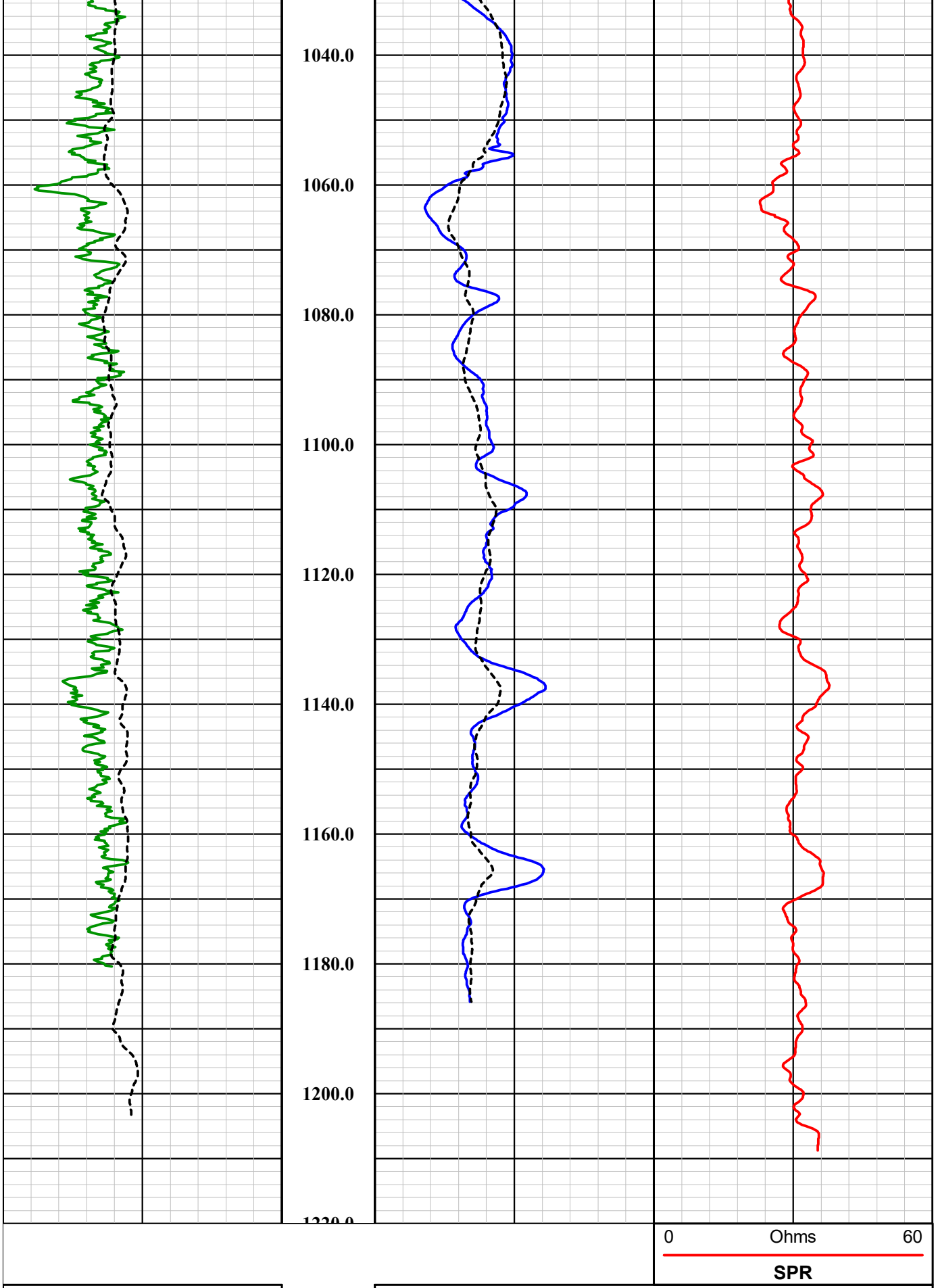
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Ohm-m
200
64" NRes
0
API
200
Nat. Gamma
1in:20ft
Depth
0
Ohm-m
200
16" NRes

MSI 40GRP E-Log Tool

Probe Top = Depth Ref.

Tool SN: 5019, 5513, & 5514

Four Conductor MSI Probe Top

Bridle connects to wireline cablehead: Wireline armor is the B Electrode.

Bridle Electrode (N Electrode)

Probe Length = 1.98 m or 6.5 ft
Bridle Length = 7.88 m or 25.86 ft

Probe Weight = 7.3 kg or 16.0 lbs

Can only be collected in fluid

Isolation Bridle

Temperature Rating: 70 Deg C (158 Deg F)
Presure Rating: 200 bar (2900 psi)

64" Normal Resistivity Electrode/Spontaneous Potential Electrode (M Electrode)

Electrode Measuring Points (from bottom of probe)

- Spontaneous Potential (SP): 1.777 m or 5.81 ft
- 16" Normal Resistivity (16" NRes): 0.3548 m or 1.16 ft
- 64" Normal Resistivity (64" NRes): 0.9644 m or 3.16 ft
- Single Point Resistance (SPR): 0.152 m or 0.50 ft
- Natural Gamma Ray (Nat. Gamma): 0.73 m or 2.39 ft

Natural Gamma Ray

16" Normal Resistivity Electrode (M Electrode)

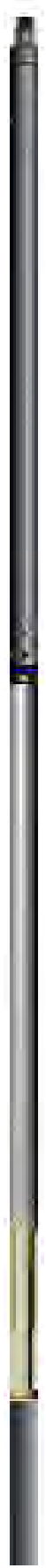
Current Electrode/Single Point Resistance Electrode (A Electrode)

1.63" or 40 mm Diameter (41.4 mm with neoprene heat shrink and electrical tape)

QL40 Gamma-Caliper-Temperature-Fluid Conductivity

Probe Top = Depth Ref.

Tool SN: 5613, 5979, 6161 & 6292



Four Conductor MSI Probe Top

Probe Length = 3.69 m or 12.12 ft
Probe Weight = 18.195 kg or 40.11 lbs

Caliper arms can only collect data logging up hole

Fluid Temperature/Conductivity and Natural Gamma can be collected logging up and down hole

Temperature Rating: 80 Deg C (176 Deg F)
Presure Rating: 200 bar (2900 psi)

Natural Gamma Ray = 1.07 m (42.12 in)

3-Arm Caliper = 1.78 m (70.27 in)

Available Arm Sizes: 3", 9", and 15"

FTC (Fluid Temperature/Conductivity) = 0.78 m (30.71 in)

1.57" or 40.0 mm Diameter

Southwest Exploration Services, LLC
borehole geophysics & video services

Company	FLORENCE COPPER COMPANY
Well	R-05
Field	FLORENCE COPPER
County	PINAL
State	ARIZONA

Final E-Log Summary

Southwest Exploration Services, LLC

borehole geophysics & video services

COMPANY	FLORENCE COPPER COMPANY
WELL ID	R-05
FIELD	FLORENCE COPPER
COUNTY	PINAL STATE ARIZONA

TYPE OF LOGS: GAMMA-CALIPER
MORE: TEMP / FLUID COND.

LOCATION

SEC TWP RGE

OTHER SERVICES
E-LOGS
SONIC
DEVIATION

PERMANENT DATUM	ELEVATION	K.B.
LOG MEAS. FROM	GROUND LEVEL ABOVE PERM. DATUM	D.F.
DRILLING MEAS. FROM	GROUND LEVEL	G.L.

DATE	11-29-17 / 02-02-18	TYPE FLUID IN HOLE	MUD
RUN No	1	MUD WEIGHT	N/A
TYPE LOG	GAMMA-CALIPER-FTC	VISCOSITY	32 VIS
DEPTH-DRILLER	1223 FT	LEVEL	FULL
DEPTH-LOGGER	1212 FT	MAX. REC. TEMP.	26.7 C
BTM LOGGED INTERVAL	1212 FT	IMAGE ORIENTED TO:	N/A
TOP LOGGED INTERVAL	SURFACE	SAMPLE INTERVAL	0.2 FT
DRILLER / RIG#	HYDRO RESOURCES	LOGGING TRUCK	TRUCK #900 / #800
RECORDED BY / Logging Eng.	K. MITCHELL	TOOL STRING/SN	QL COMBO TOOL SN 5613
WITNESSED BY	H&A - LAUREN C	LOG TIME:ON SITE/OFF SITE	8:00 AM

RUN	BOREHOLE RECORD			CASING RECORD			
NO.	BIT	FROM	TO	SIZE	WGT.	FROM	TO
1	?"	SURFACE	40 FT	24"	STEEL	SURFACE	40 FT
2	20"	40 FT	500 FT	14"	STEEL	SURFACE	500 FT
3	12 1/4"	500 FT	TOTAL DEPTH				

COMMENTS:

.

Tool Summary:

Date	11-29-17 / 02-02-18	**Date**	11-29-17 / 02-02-18	**Date**	11-29-17 / 02-02-18
Run No.	1	**Run No.**	2	**Run No.**	3
Tool Model	MSI E-LOG 40GRP	**Tool Model**	QL COMBO TOOL	**Tool Model**	2DVA / QL DVA
Tool SN	4790 / 5513	**Tool SN**	4183 / 5613	**Tool SN**	6002 / 142201
From	SURFACE	**From**	SURFACE	**From**	SURFACE
To	1200 FT	**To**	1200 FT	**To**	1200 FT
Recorded By	K. MITCHELL	**Recorded By**	K. MITCHELL	**Recorded By**	K. MITCHELL
Truck No	900 / 800	**Truck No**	900 / 800	**Truck No**	900 / 800
Operation Check	02-02-18	**Operation Check**	02-02-18	**Operation Check**	02-02-18
Calibration Check	02-02-18	**Calibration Check**	02-02-18	**Calibration Check**	N/A
Time Logged	8:00 AM	**Time Logged**	9:00 AM	**Time Logged**	10:00 AM

Date	11-29-17 / 02-02-18	**Date**		**Date**	
Run No.	4	**Run No.**	5	**Run No.**	6
Tool Model	MSI 60MM SONIC	**Tool Model**		**Tool Model**	
Tool SN	5050	**Tool SN**		**Tool SN**	
From	SURFACE	**From**		**From**	
To	1200 FT	**To**		**To**	
Recorded By	K. MITCHELL	**Recorded By**		**Recorded By**	
Truck No	900 / 800	**Truck No**		**Truck No**	
Operation Check	02-02-18	**Operation Check**		**Operation Check**	
Calibration Check	N/A	**Calibration Check**		**Calibration Check**	
Time Logged	11:00 AM	**Time Logged**		**Time Logged**	

Additional Comments:

Caliper Arms Used: 16" **Calibration Points:** 10" & 21 "

E-Log Calibration Range: 0 - 1,000 OHM-M **Calibration Points:** 1 & 1,000 OHM-/M

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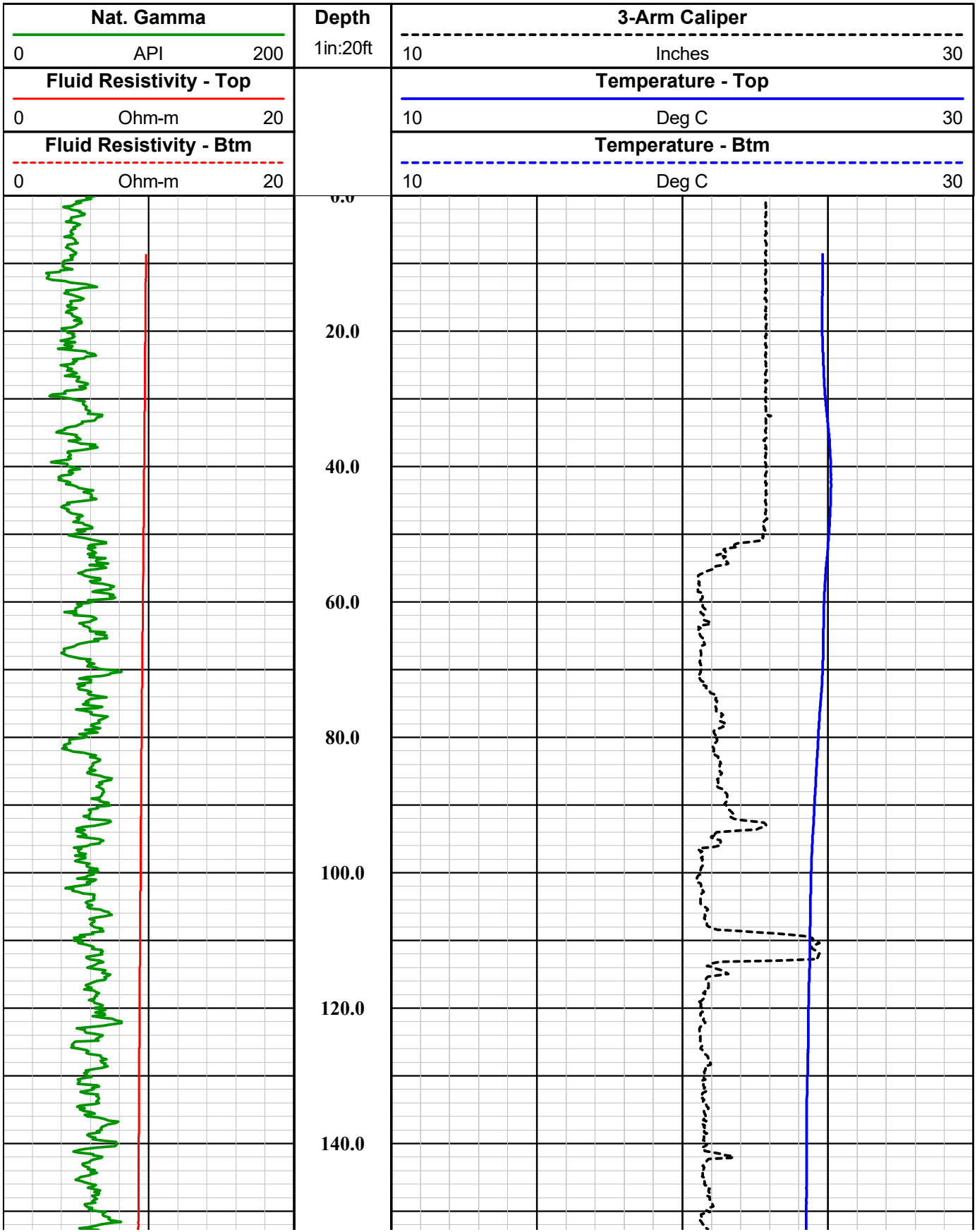

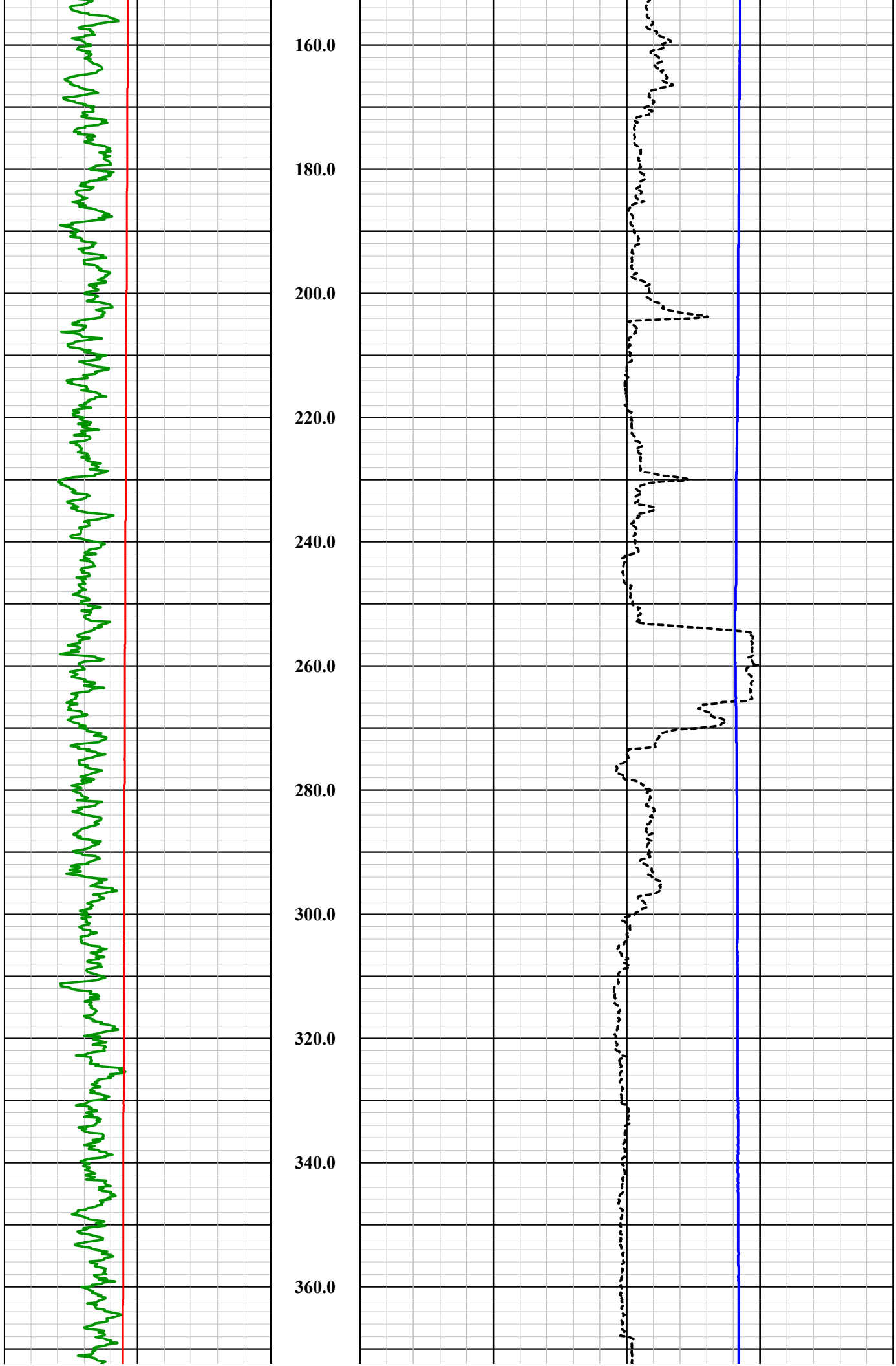
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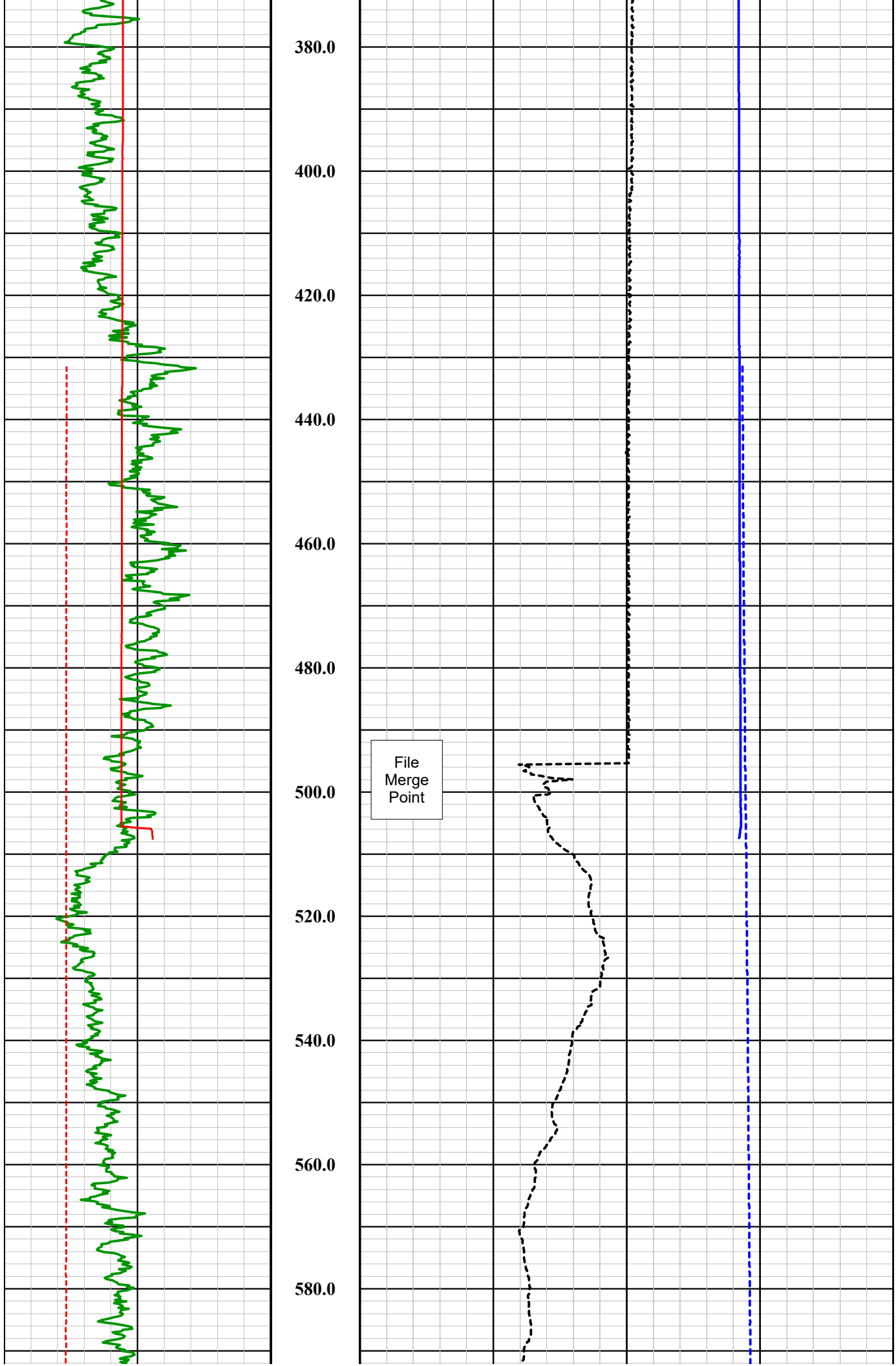
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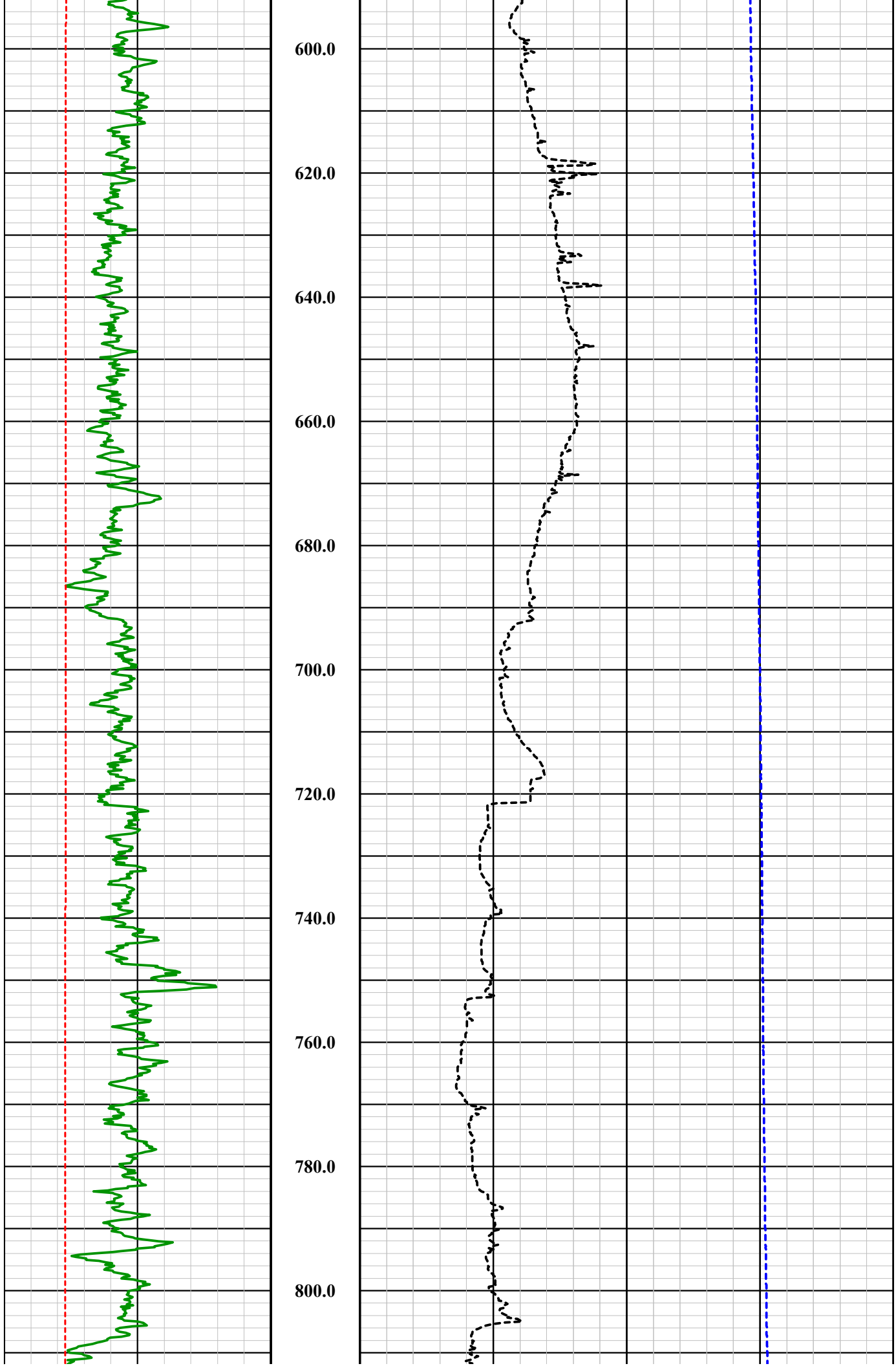
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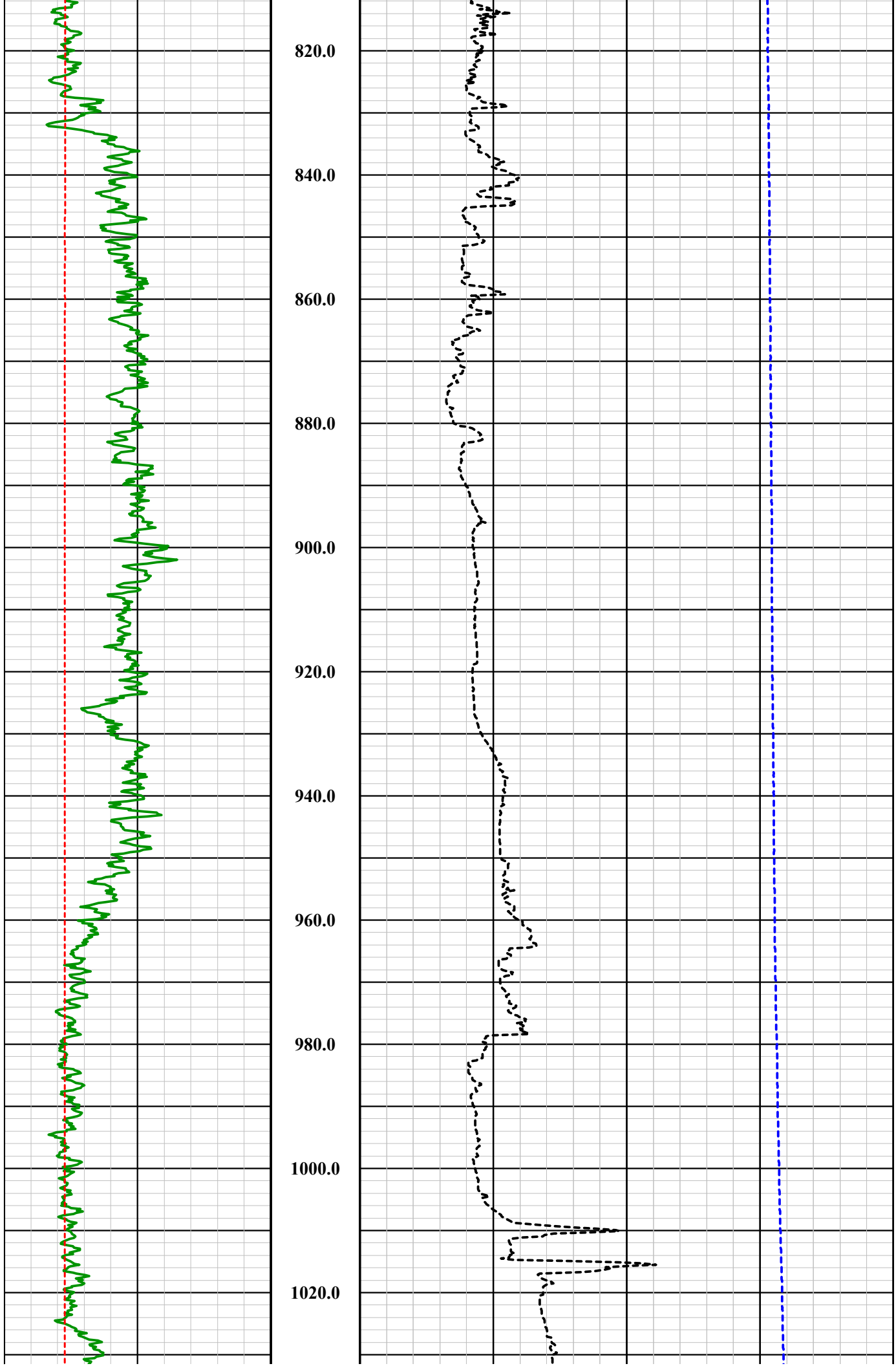
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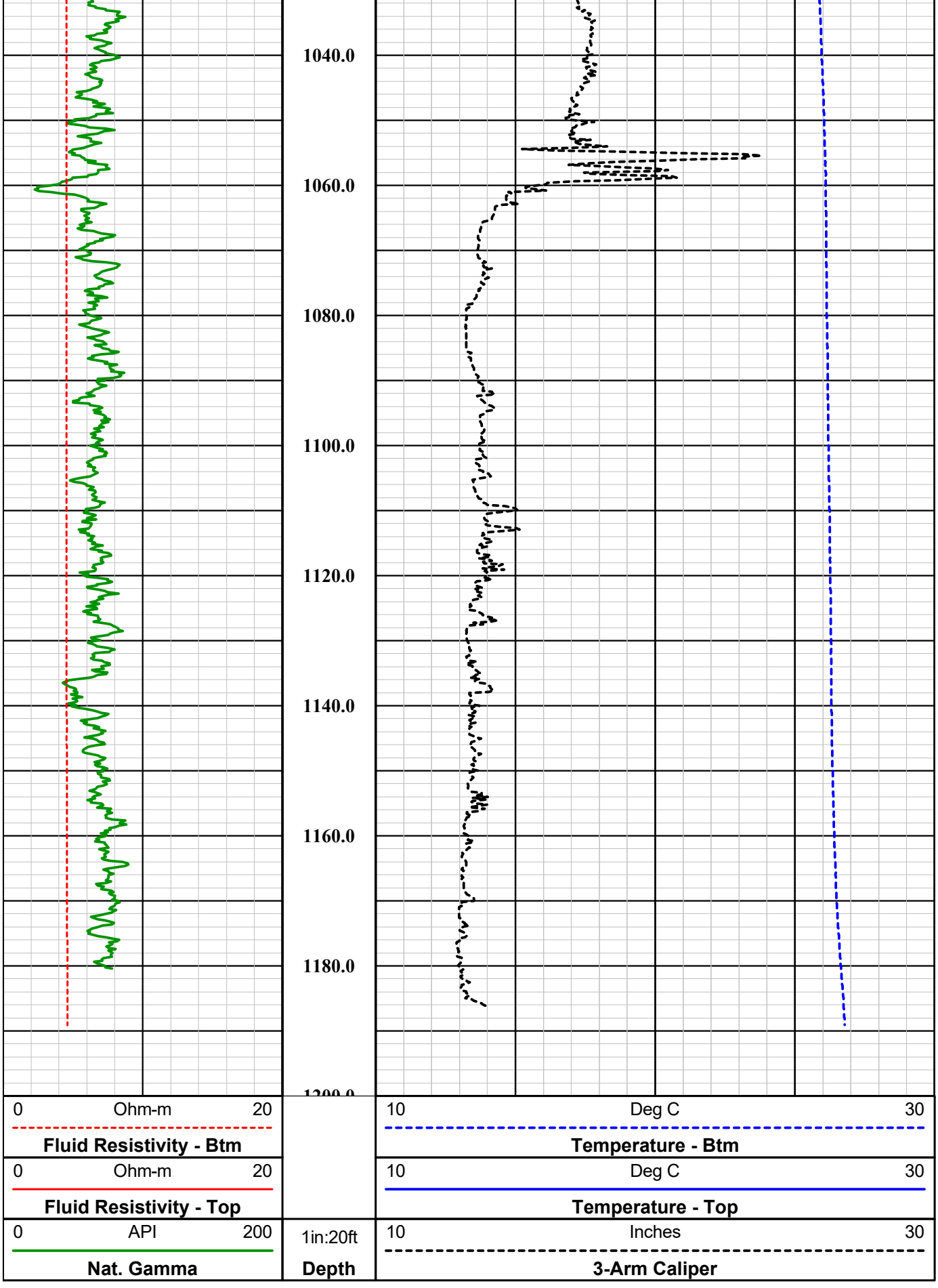
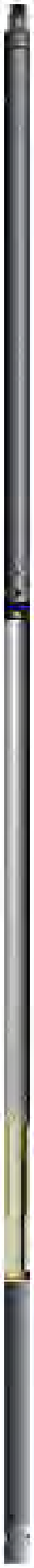


QL40 Gamma-Caliper-Temperature-Fluid Conductivity

Probe Top = Depth Ref.

Tool SN: 5613, 5979, 6161 & 6292

Tool SN: 5613, 5979, 6161 & 6292



Four Conductor MSI Probe Top

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1.57" or 40.0 mm Diameter

	Company	FLORENCE COPPER COMPANY

Southwest Exploration Services, LLC

borehole geophysics & video services

Well	R-05
Field	FLORENCE COPPER
County	PINAL
State	ARIZONA

Final GCFTC Summary

Southwest Exploration Services, LLC

borehole geophysics & video services

COMPANY FLORENCE COPPER COMPANY
WELL ID R-05
FIELD FLORENCE COPPER
COUNTY PINAL STATE ARIZONA

TYPE OF LOGS: 60mm SONIC
MORE: GAMMA-CALIPER
LOCATION

SEC TWP RGE

OTHER SERVICES
CALIPER
TEMP / FLUID COND.
E-LOGS
DEVIATION

PERMANENT DATUM		ELEVATION	K.B.
LOG MEAS. FROM	GROUND LEVEL	ABOVE PERM. DATUM	D.F.
DRILLING MEAS. FROM	GROUND LEVEL		G.L.

DATE	11-29-17 / 02-02-18	TYPE FLUID IN HOLE	MUD
RUN No	1	MUD WEIGHT	N/A
TYPE LOG	SONIC-GAMMA-CALIPER	VISCOSITY	32 VIS
DEPTH-DRILLER	1223 FT	LEVEL	FULL
DEPTH-LOGGER	1212 FT	MAX. REC. TEMP.	24.3 C
BTM LOGGED INTERVAL	1212 FT	IMAGE ORIENTED TO:	N/A
TOP LOGGED INTERVAL	SURFACE	SAMPLE INTERVAL	0.2 FT
DRILLER / RIG#	HYDRO RESOURCES	LOGGING TRUCK	TRUCK #900 / #800
RECORDED BY / Logging Eng.	K. MITCHELL	TOOL STRING/SN	MSI 60MM SONIC SN 5050
WITNESSED BY	H&A - LAUREN C	LOG TIME:ON SITE/OFF SITE	8:30 AM

RUN	BOREHOLE RECORD			CASING RECORD			
NO.	BIT	FROM	TO	SIZE	WGT.	FROM	TO
1	?"	SURFACE	40 FT	24"	STEEL	SURFACE	40 FT
2	20"	40 FT	500 FT	14"	STEEL	SURFACE	500 FT
3	12 1/4"	500 FT	TOTAL DEPTH				

COMMENTS:

.

Tool Summary:

Date	11-29-17 / 02-02-18	**Date**	11-29-17 / 02-02-18	**Date**	11-29-17 / 02-02-18		
Run No.	1	**Run No.**	2	**Run No.**	3	**Date**	
Tool Model	MSI E-LOG 40GRP	**Tool Model**	QL COMBO TOOL	**Tool Model**	2DVA / QL DVA	**Run No.**	6
Tool SN	4790 / 5513	**Tool SN**	4183 / 5613	**Tool SN**	6002 / 142201	**Tool Model**	
From	SURFACE	**From**	SURFACE	**From**	SURFACE	**Tool SN**	
To	1200 FT	**To**	1200 FT	**To**	1200 FT	**From**	
Recorded By	K. MITCHELL	**Recorded By**	K. MITCHELL	**Recorded By**	K. MITCHELL	**To**	
Truck No	900 / 800	**Truck No**	900 / 800	**Truck No**	900 / 800	**Recorded By**	
Operation Check	02-02-18	**Operation Check**	02-02-18	**Operation Check**	02-02-18	**Truck No**	
Calibration Check	02-02-18	**Calibration Check**	02-02-18	**Calibration Check**	N/A	**Operation Check**	
Time Logged	8:00 AM	**Time Logged**	9:00 AM	**Time Logged**	10:00 AM	**Calibration Check**	
						Time Logged	
Date	11-29-17 / 02-02-18						
Run No.	4	**Run No.**	5				
Tool Model	MSI 60MM SONIC	**Tool Model**					
Tool SN	5050	**Tool SN**					
From	SURFACE	**From**					
To	1200 FT	**To**					
Recorded By	K. MITCHELL	**Recorded By**					
Truck No	900 / 800	**Truck No**					
Operation Check	02-02-18	**Operation Check**					
Calibration Check	N/A	**Calibration Check**					
Time Logged	11:00 AM	**Time Logged**					

Additional Comments:

Caliper Arms Used: 16" **Calibration Points:** 10" & 21"

E-Log Calibration Range: 0 - 1,000 OHM-M **Calibration Points:** 1 & 1,000 OHM-M

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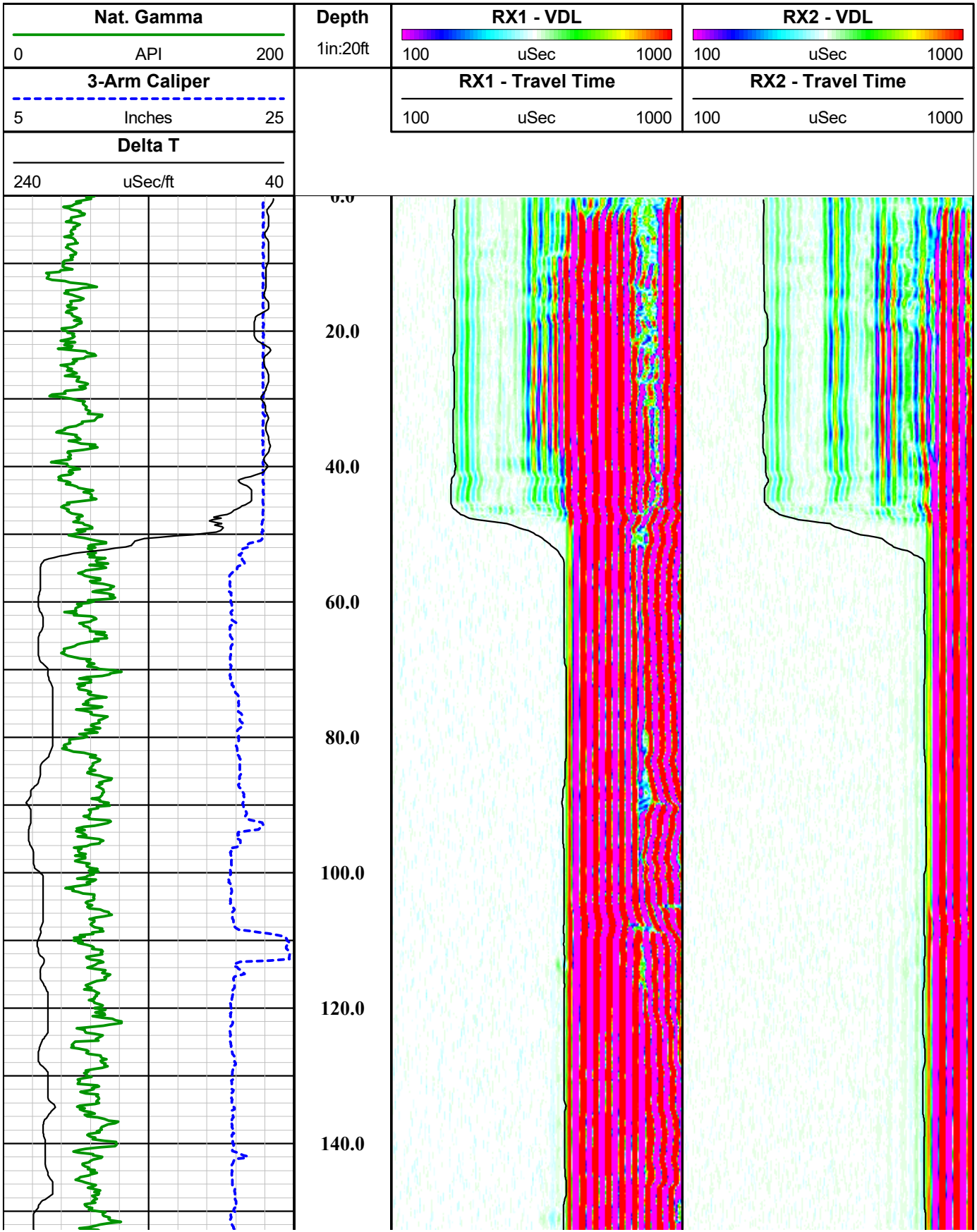

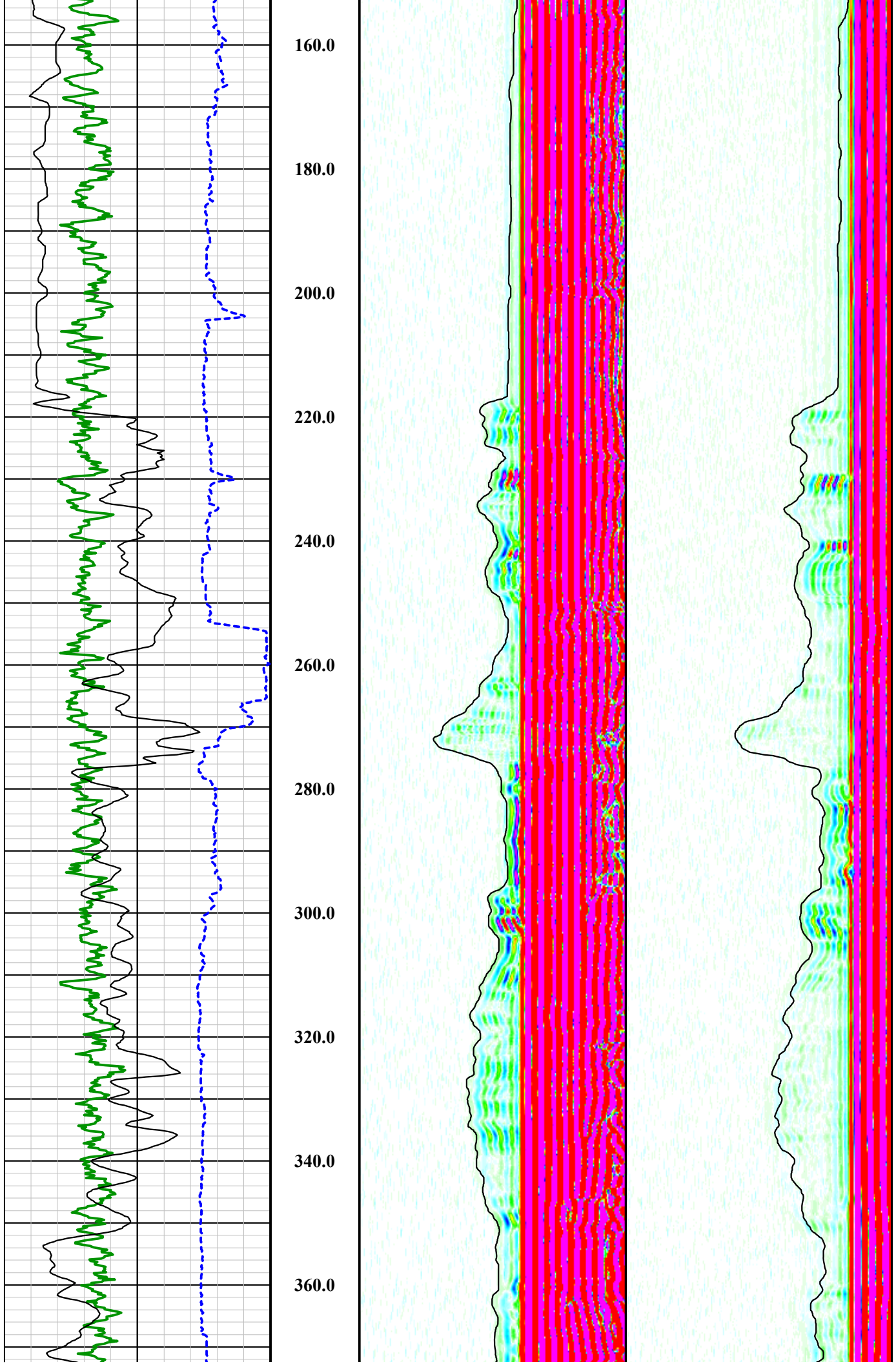
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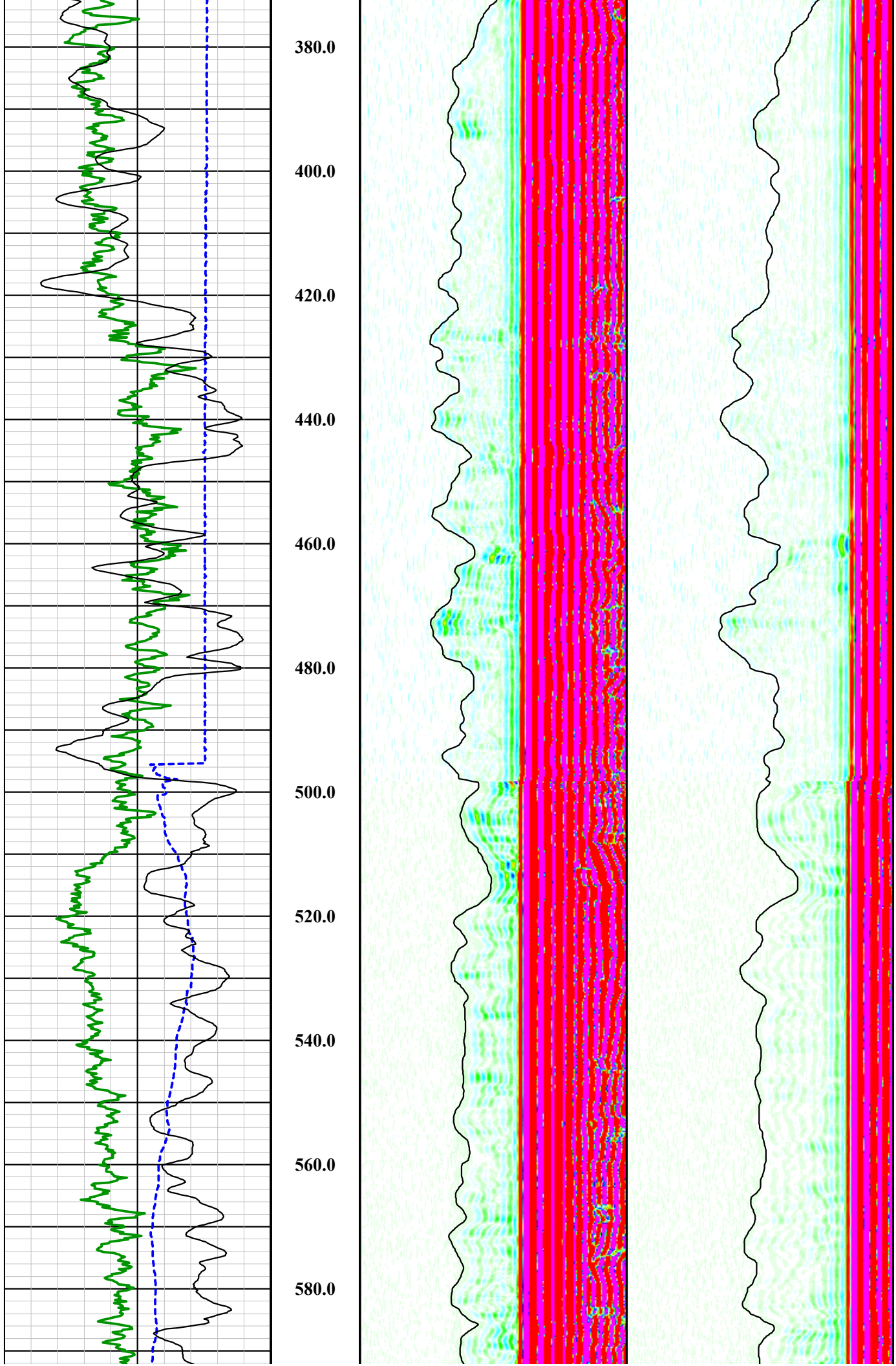
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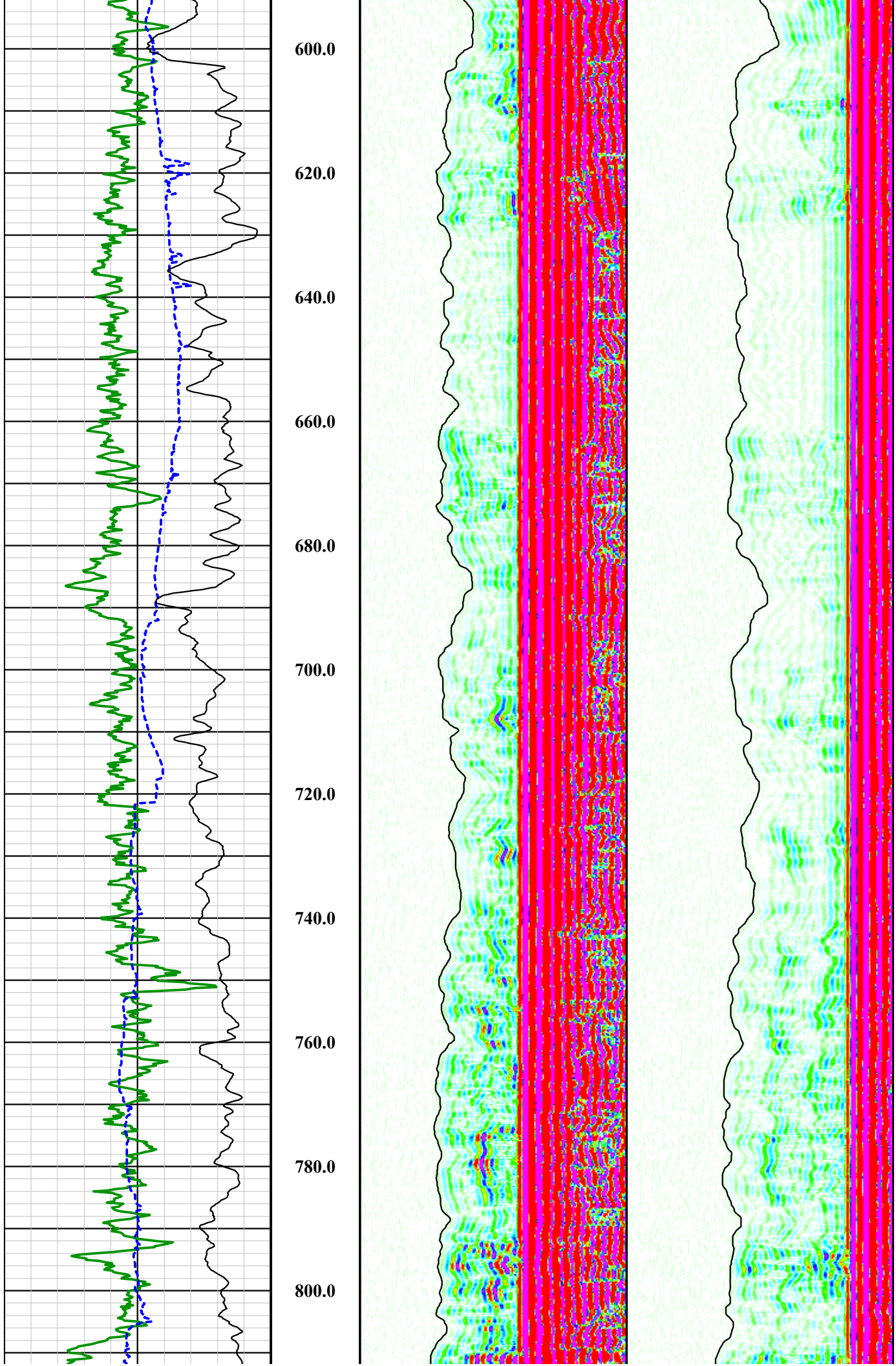
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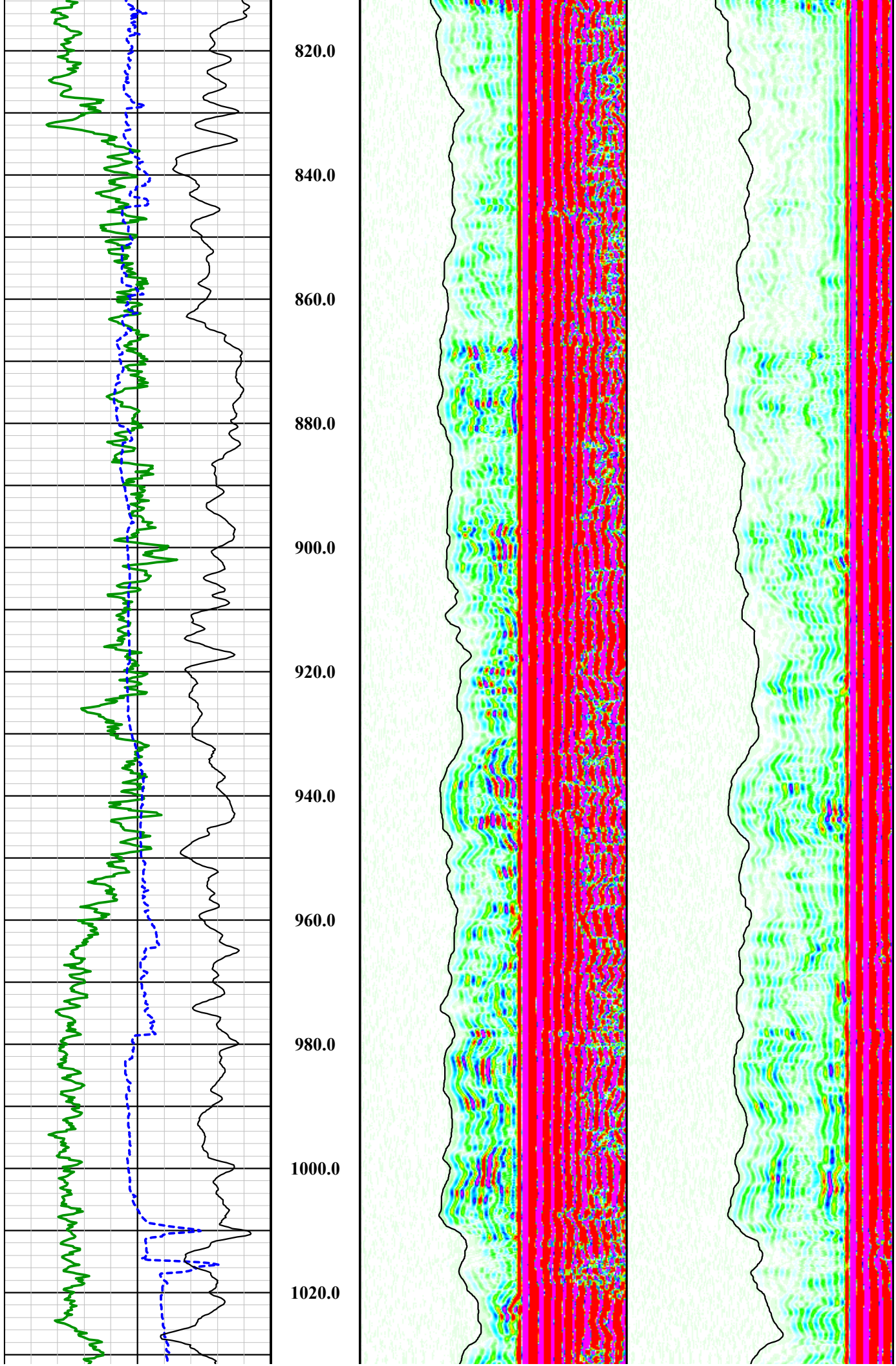
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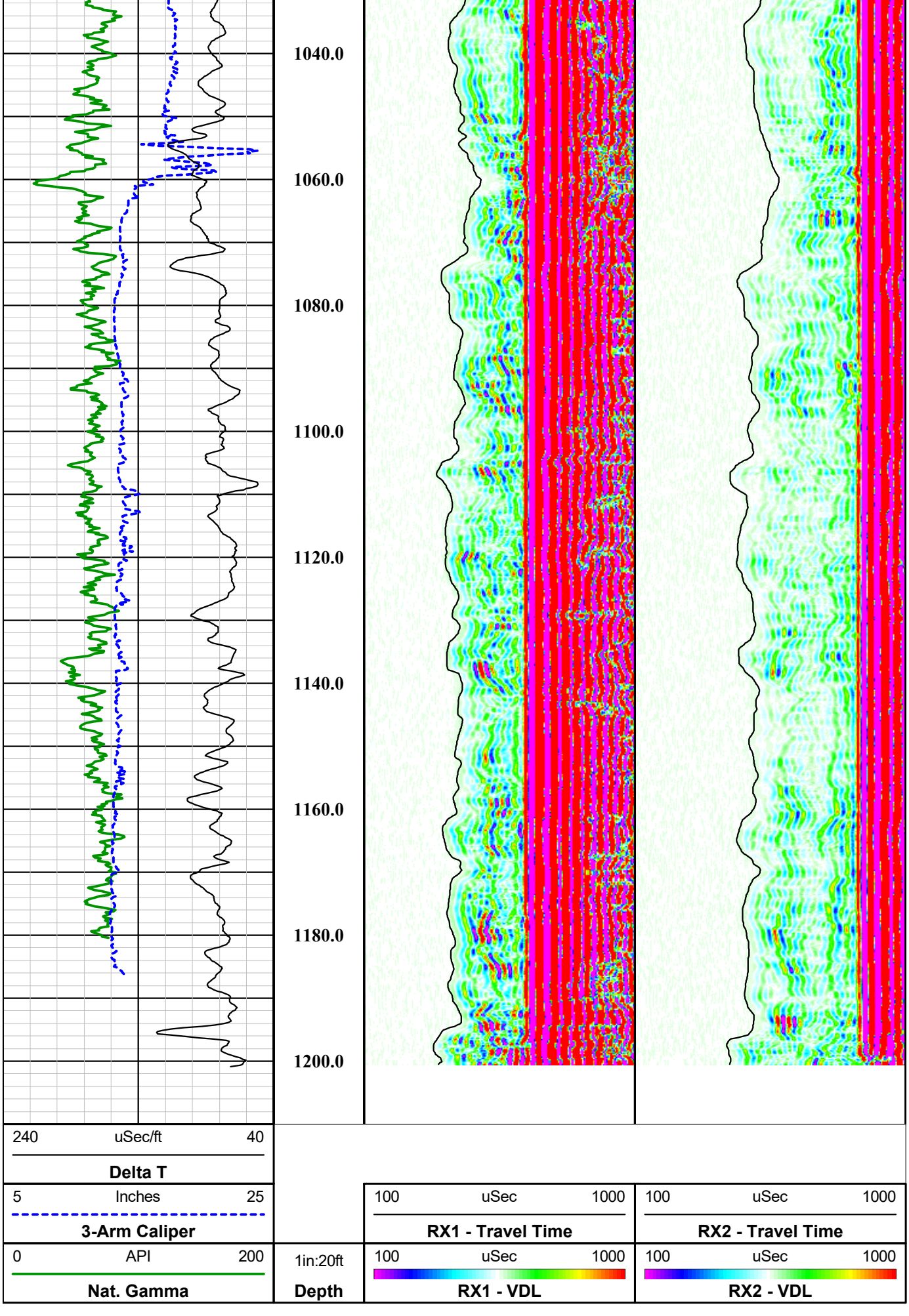

MSI 60 mm 2 RX Full Waveform Sonic Tool

Probe Top = Depth Ref.

Tool SN: 5001, 5050 & 6003

Four Conductor MSI Probe Top

Probe Length = 2.8 m or 9.19 ft
Probe Weight = ~26.5 kg or 58.4 lbs

Sensors: Ceramic Piezoelectric

Transmitter Frequency: 24 - 28 kHz resonant frequency

Rx - Rx Spacing: 0.3 m (12.0 in)

Typically centralized with external centralizers

Can only be collected in fluid

Temperature Rating: 80 Deg C (176 Deg F)
Presure Rating: 200 bar (2900 psi)

Rx-2 Tx - Rx2 Spacing = 1.22 m (48.0 in)

Rx-1 Tx - Rx1 Spacing = .91 m (36.0 in)

Acoustic Isolater

Tx = Acoustic Transmitter

0.660 m or 26.0 in. - End of tool to center of Tx

2.36 in or 60 mm Diameter

QL40 Gamma-Caliper-Temperature-Fluid Conductivity

Probe Top = Depth Ref.

Tool SN: 5613, 5979, 6161 & 6292

Four Conductor MSI Probe Top

Probe Length = 3.69 m or 12.12 ft
Probe Weight = 18.195 kg or 40.11 lbs

Caliper arms can only collect data logging up hole

Fluid Temperature/Conductivity and Natural Gamma can be collected logging up and down hole

Temperature Rating: 80 Deg C (176 Deg F)
Presure Rating: 200 bar (2900 psi)

Natural Gamma Ray = 1.07 m (42.12 in)

3-Arm Caliper = 1.78 m (70.27 in)

Available Arm Sizes: 3", 9", and 15"

FTC (Fluid Temperature/Conductivity) = 0.78 m (30.71 in)

1.57" or 40.0 mm Diameter

Southwest Exploration Services, LLC
borehole geophysics & video services

Company	FLORENCE COPPER COMPANY
Well	R-05
Field	FLORENCE COPPER
County	PINAL
State	ARIZONA

Final Sonic Summary

Southwest Exploration Services, LLC

borehole geophysics & video services

COMPANY	FLORENCE COPPER
WELL ID	R-05
FIELD	FLORENCE COPPER
COUNTY	PINAL
STATE	ARIZONA

TYPE OF LOGS: 3-ARM CALIPER
MORE: W / VOLUME CALC.

LOCATION

SEC TWP RGE

OTHER SERVICES
E-LOG
SONIC
DEVIATION
NAT. GAMMA
TEMPERATURE
FLUID RESISTIVITY

PERMANENT DATUM	ELEVATION	K.B.
LOG MEAS. FROM	GROUND LEVEL ABOVE PERM. DATUM	D.F.
DRILLING MEAS. FROM	GROUND LEVEL	G.L.

DATE	11-29-17	TYPE FLUID IN HOLE	MUD
RUN No	1	MUD WEIGHT	N/A
TYPE LOG	VOLUME CALCULATION	VISCOSITY	N/A
DEPTH-DRILLER	506 FT.	LEVEL	FULL
DEPTH-LOGGER	504 FT.	MAX. REC. TEMP.	25.10 DEG. C
BTM LOGGED INTERVAL	504 FT.	IMAGE ORIENTED TO:	N/A
TOP LOGGED INTERVAL	SURFACE	SAMPLE INTERVAL	0.2 FT.
DRILLER / RIG#	HYDRO RESOURCES	LOGGING TRUCK	TRUCK #900
RECORDED BY / Logging Eng.	A. OLSON / M. QUINONES	TOOL STRING/SN	MSI COMBO TOOL SN 4183
WITNESSED BY	CHAD - H&A	LOG TIME:ON SITE/OFF SITE	12:00 A.M.

RUN	BOREHOLE RECORD			CASING RECORD			
NO.	BIT	FROM	TO	SIZE	WGT.	FROM	TO
1	? IN.	SURFACE	40 FT.	24 IN.	STEEL	SURFACE	40 FT.
2	20 IN.	40 FT.	TOTAL DEPTH				
3							

COMMENTS:

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Tool Summary:

Date	11-29-17	**Date**	11-29-17	**Date**	11-29-17		
Run No.	1	**Run No.**	2	**Run No.**	3		
Tool Model	MSI COMBO TOOL	**Tool Model**	GEOVISTA E-LOG	**Tool Model**	MSI 60MM SONIC		
Tool SN	4183	**Tool SN**	4790	**Tool SN**	5050		
From	SURFACE	**From**	SURFACE	**From**	SURFACE		
To	504 FT.	**To**	504 FT.	**To**	504 FT.		
Recorded By	A. OLSON	**Recorded By**	A. OLSON	**Recorded By**	A. OLSON		
Truck No	900	**Truck No**	900	**Truck No**	900		
Operation Check	11-27-17	**Operation Check**	11-27-17	**Operation Check**	11-27-17		
Calibration Check	11-27-17	**Calibration Check**	11-27-17	**Calibration Check**	N/A		
Time Logged	5:35 A.M.	**Time Logged**	6:10 A.M.	**Time Logged**	6:30 A.M.		

Date	11-29-17	**Date**		**Date**			
Run No.	4	**Run No.**	5	**Run No.**	6		
Tool Model	MSI DEVIATION	**Tool Model**		**Tool Model**			
Tool SN	6002	**Tool SN**		**Tool SN**			
From	SURFACE	**From**		**From**			
To	504 FT.	**To**		**To**			
Recorded By	A. OLSON	**Recorded By**		**Recorded By**			
Truck No	900	**Truck No**		**Truck No**			
Operation Check	11-27-17	**Operation Check**		**Operation Check**			
Calibration Check	N/A	**Calibration Check**		**Calibration Check**			
Time Logged	7:10 A.M.	**Time Logged**		**Time Logged**			

Additional Comments:

Caliper Arms Used: 15 IN. **Calibration Points:** 8 IN. & 23 IN.

E-Log Calibration Range: 10-1000 OHM-M **Calibration Points:** 10 & 1000 OHM-M

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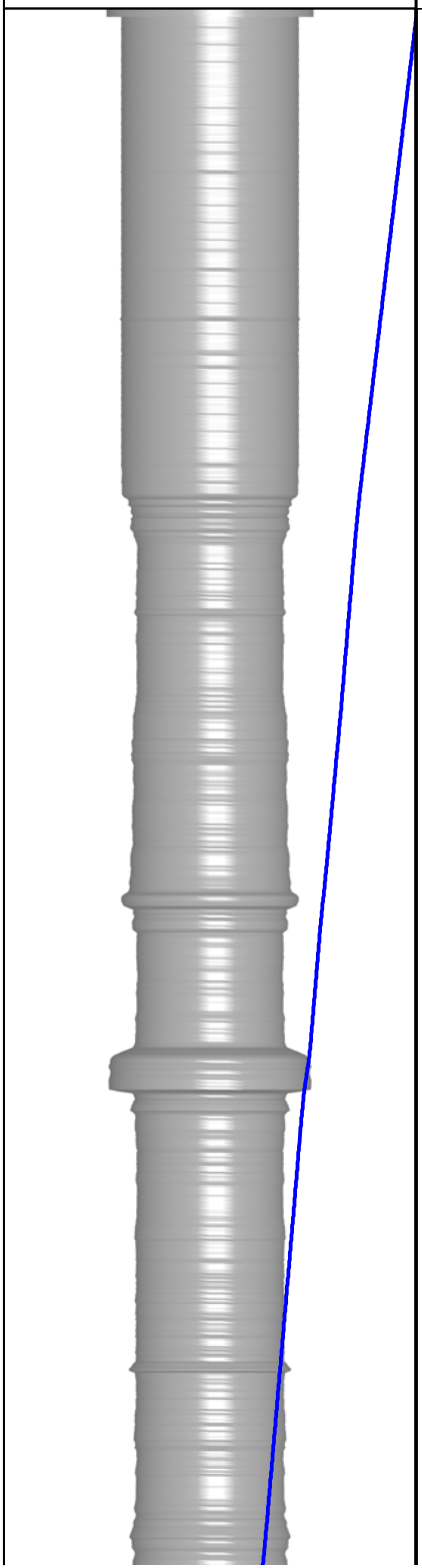
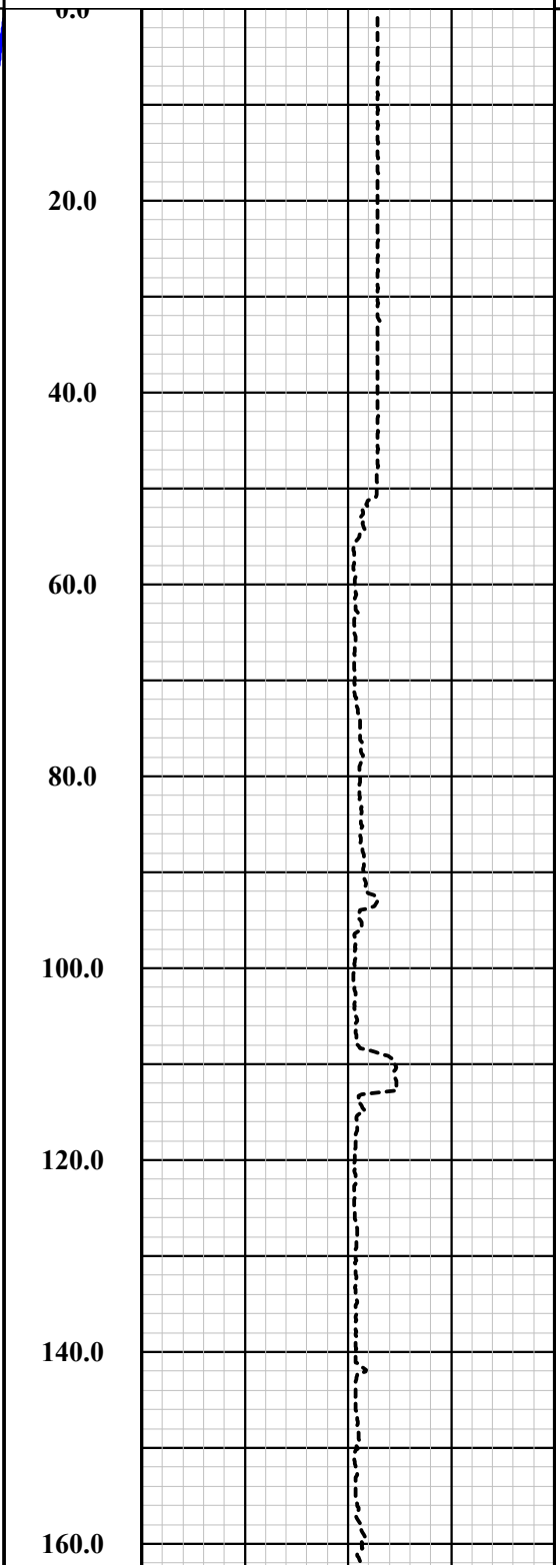
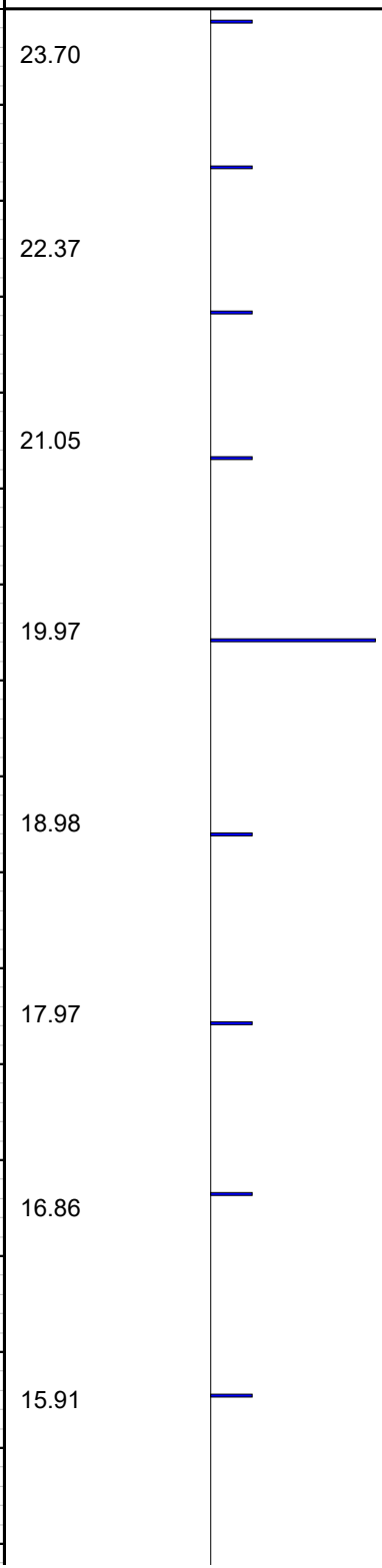
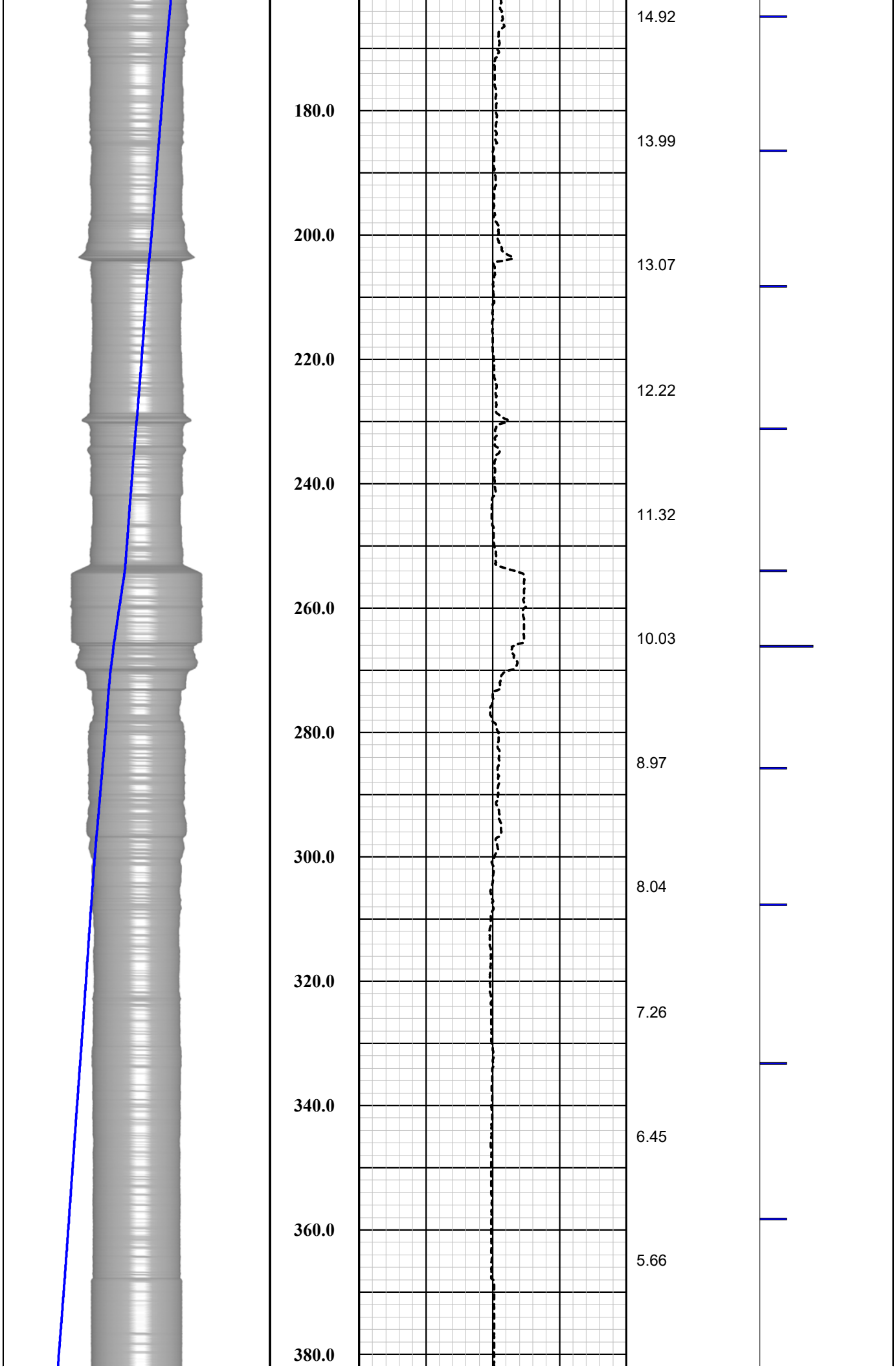
Total Volume	Depth	3-Arm Caliper	Cumulated Volume (cu.yd)
0 cu.yd 23.95	1in:20ft	0 Inches 40	
3-D View			Based on 14" OD Casing
-0°			





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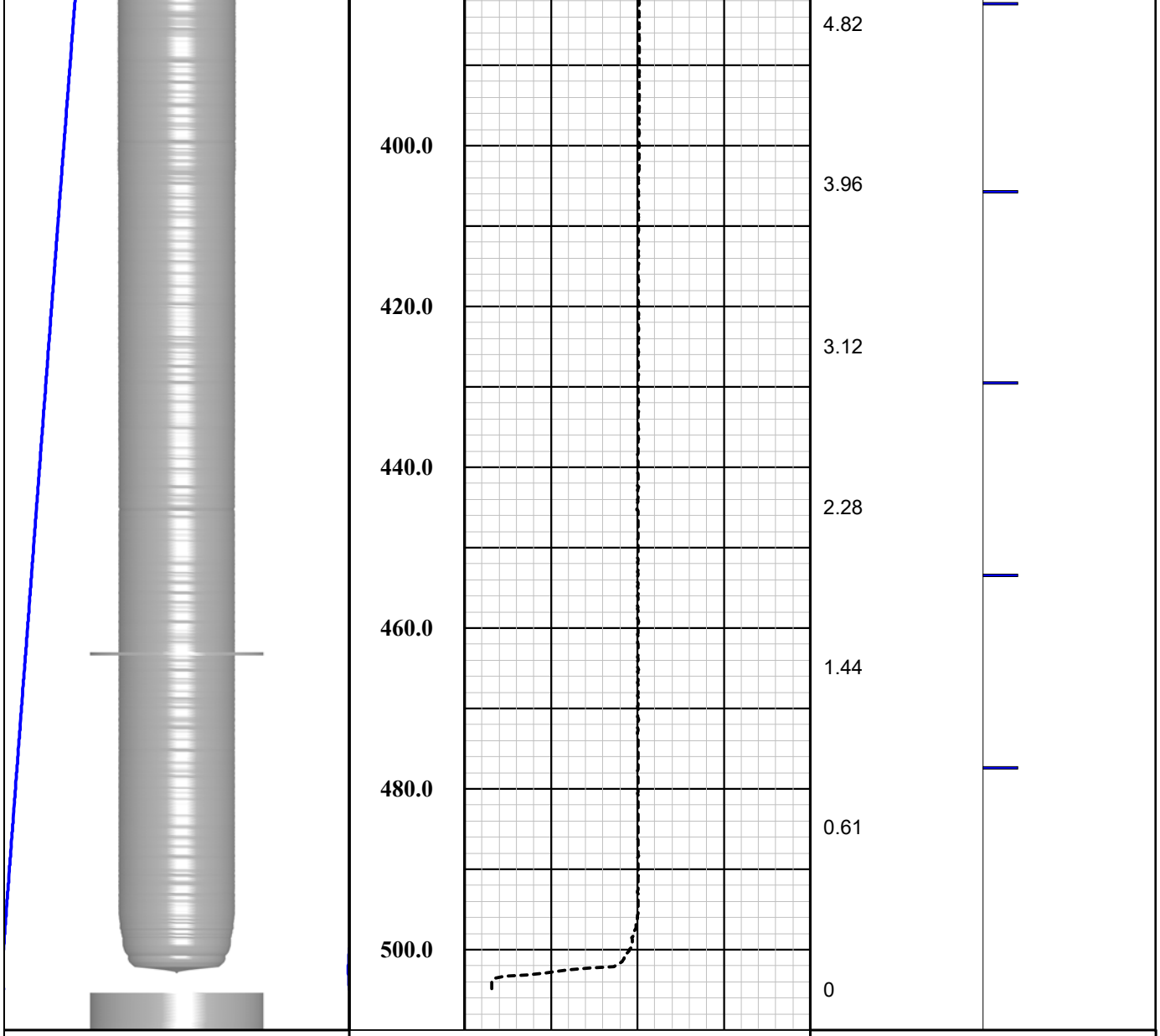
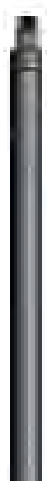


MSI Gamma-Caliper-Temperature-Fluid Resistivity

Probe Top = Depth Ref.



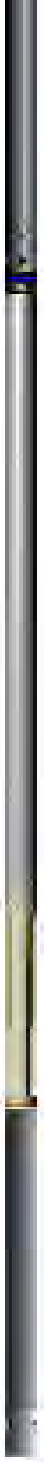
Single Conductor MSI Probe Top

Probe Length = 2.59 m or 8.5 ft
Probe Weight = 6.80 kg or 15.0 lbs

Natural Gamma and Caliper can only be collected logging up hole.

Fluid Temperature/Resistivity can only be collected logging down hole.

Temperature Rating: 70 Deg C (158 Deg F)
Presure Rating: 200 bar (2900 psi)



Natural Gamma Ray = 0.76 m (29.75 in)

NOTE: Lengths on a particular tool may vary from those listed on this document due to probe sizes and styles utilized

3-Arm Caliper = 1.44 m (56.75 in)

Distance from tool top: 2.20 m (86.5 in)

Available Arm Sizes: 3", 9", and 15"

TFR (Temperature/Fluid Resistivity) = 0.39 m (15.5 in)

1.375" or 34.9 mm Diameter

Southwest Exploration Services, LLC
borehole geophysics & video services

Company	FLORENCE COPPER
Well	R-05
Field	FLORENCE COPPER
County	PINAL
State	ARIZONA

Final Caliper w/ Volume Calculation Summary

Southwest Exploration Services, LLC

borehole geophysics & video services

COMPANY	FLORENCE COPPER COMPANY
WELL ID	R-05
FIELD	FLORENCE COPPER
COUNTY	PINAL STATE ARIZONA

TYPE OF LOGS: VOLUME CALCULATION
MORE: BASED ON 5.5" CASING

LOCATION

SEC TWP RGE

OTHER SERVICES
GAMMA
TEMP / FLUID COND.
SONIC
DEVIATION

PERMANENT DATUM	ELEVATION	K.B.
LOG MEAS. FROM	GROUND LEVEL ABOVE PERM. DATUM	D.F.
DRILLING MEAS. FROM	GROUND LEVEL	G.L.

DATE	02-02-18	TYPE FLUID IN HOLE	MUD
RUN No	1	MUD WEIGHT	N/A
TYPE LOG	VOLUME CALCULATION	VISCOSITY	32 VIS
DEPTH-DRILLER	1223 FT	LEVEL	FULL
DEPTH-LOGGER	1212 FT	MAX. REC. TEMP.	24.3 C
BTM LOGGED INTERVAL	1212 FT	IMAGE ORIENTED TO:	N/A
TOP LOGGED INTERVAL	SURFACE	SAMPLE INTERVAL	0.2 FT
DRILLER / RIG#	HYDRO RESOURCES	LOGGING TRUCK	TRUCK #800
RECORDED BY / Logging Eng.	K. MITCHELL	TOOL STRING/SN	QL COMBO TOOL SN 5613
WITNESSED BY	H&A - LAUREN C	LOG TIME:ON SITE/OFF SITE	8:30 AM

RUN	BOREHOLE RECORD			CASING RECORD			
NO.	BIT	FROM	TO	SIZE	WGT.	FROM	TO
1	?"	SURFACE	40 FT	14"	STEEL	SURFACE	40 FT
2	12 1/4"	40 FT	TOTAL DEPTH				
3							

COMMENTS:

.

Tool Summary:

Date	02-02-18	**Date**	02-02-18	**Date**	02-02-18		
Run No.	1	**Run No.**	2	**Run No.**	3		
Tool Model	MSI E-LOG 40GRP	**Tool Model**	QL COMBO TOOL	**Tool Model**	QL DEVIATION		
Tool SN	5613	**Tool SN**	5613	**Tool SN**	5979		
From	485 FT	**From**	480 FT	**From**	480 FT		
To	1200 FT	**To**	1200 FT	**To**	1200 FT		
Recorded By	K. MITCHELL	**Recorded By**	K. MITCHELL	**Recorded By**	K. MITCHELL		
Truck No	800	**Truck No**	800	**Truck No**	800		
Operation Check	02-02-18	**Operation Check**	02-02-18	**Operation Check**	02-02-18		
Calibration Check	02-02-18	**Calibration Check**	02-02-18	**Calibration Check**	N/A		
Time Logged	8:00 AM	**Time Logged**	9:00 AM	**Time Logged**	10:00 AM		

Date	02-02-18	**Date**		**Date**			
Run No.	4	**Run No.**	5	**Run No.**	6		
Tool Model	MSI 60MM SONIC	**Tool Model**		**Tool Model**			
Tool SN	5050	**Tool SN**		**Tool SN**			
From	SURFACE	**From**		**From**			
To	1200 FT	**To**		**To**			
Recorded By	K. MITCHELL	**Recorded By**		**Recorded By**			
Truck No	800	**Truck No**		**Truck No**			
Operation Check	02-02-18	**Operation Check**		**Operation Check**			
Calibration Check	N/A	**Calibration Check**		**Calibration Check**			
Time Logged	11:00 AM	**Time Logged**		**Time Logged**			

Additional Comments:

Caliper Arms Used: 16" **Calibration Points:** 10" & 21"

E-Log Calibration Range: 0 - 1,000 OHM-M **Calibration Points:** 1 & 1,000 OHM-M

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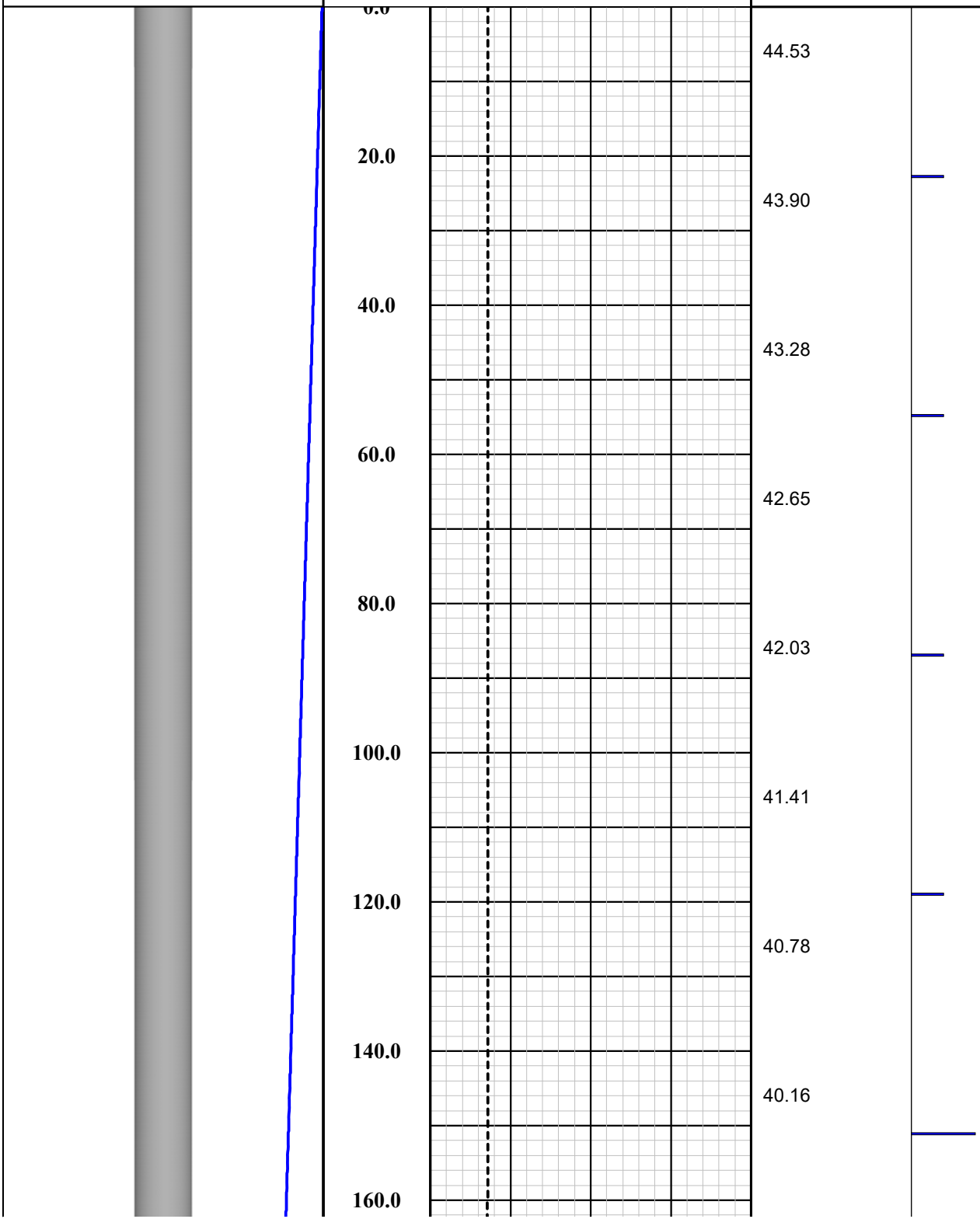
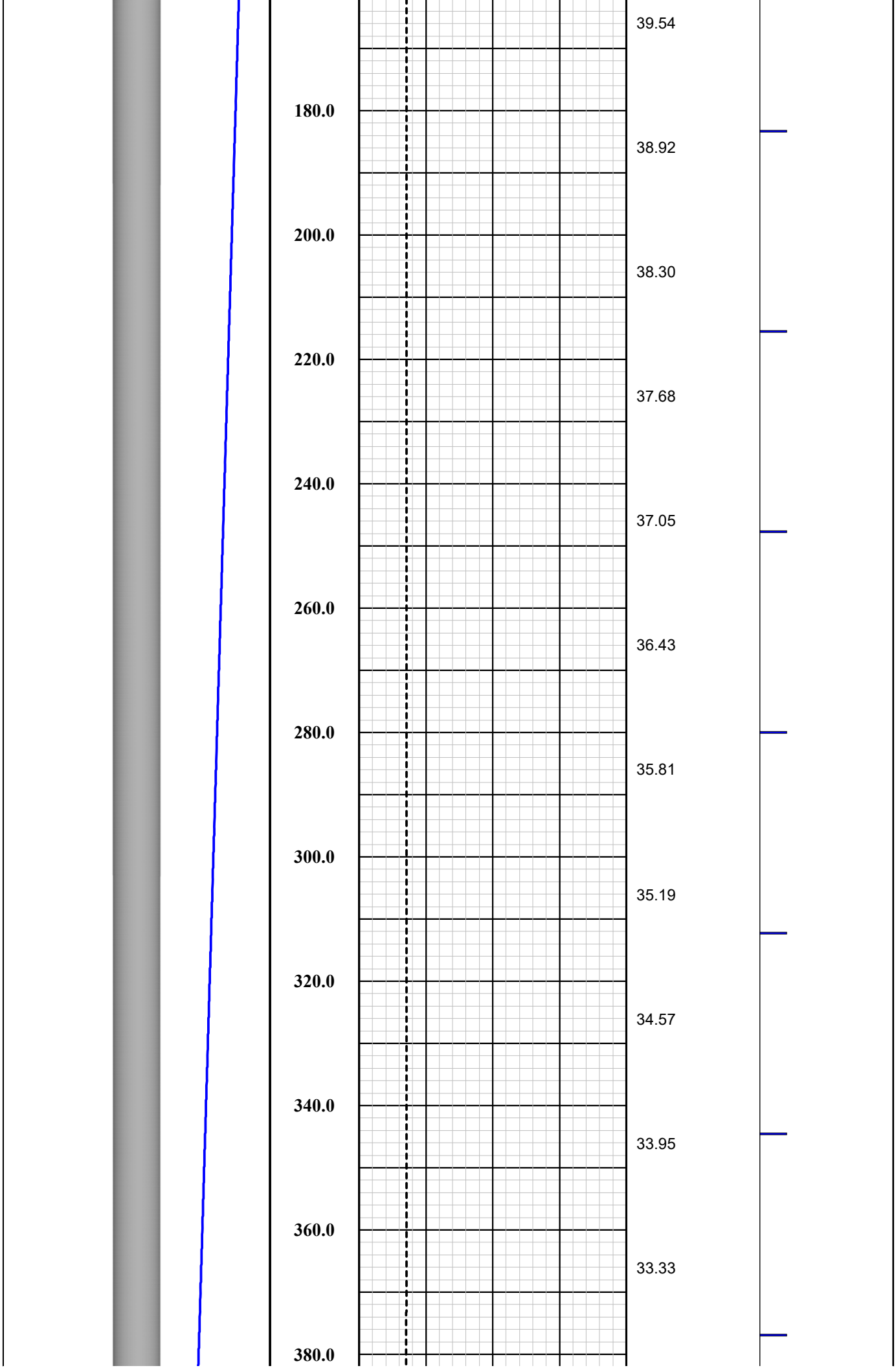
Total Volume	Depth	3-Arm Caliper	Cumulated Volume (cu.yd)
0 cu.yd 44.9	1in:20ft	10 Inches 30	
3-D View			Based on 5.5 OD Casing
-0°			

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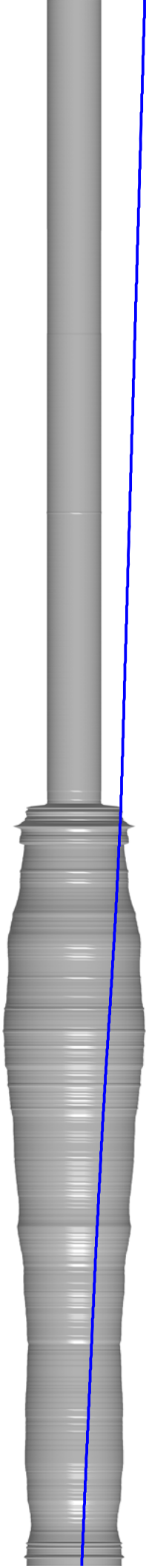

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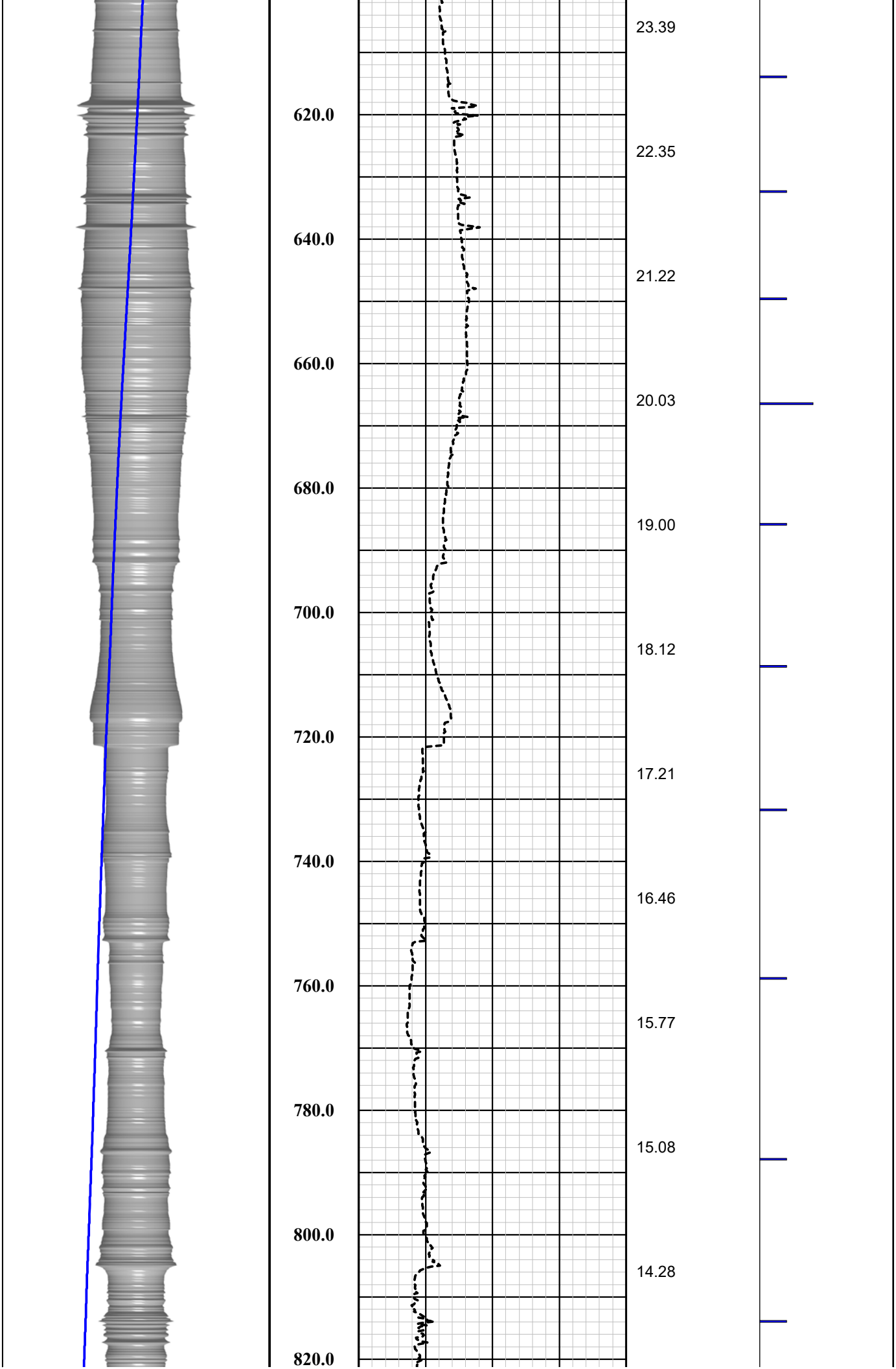
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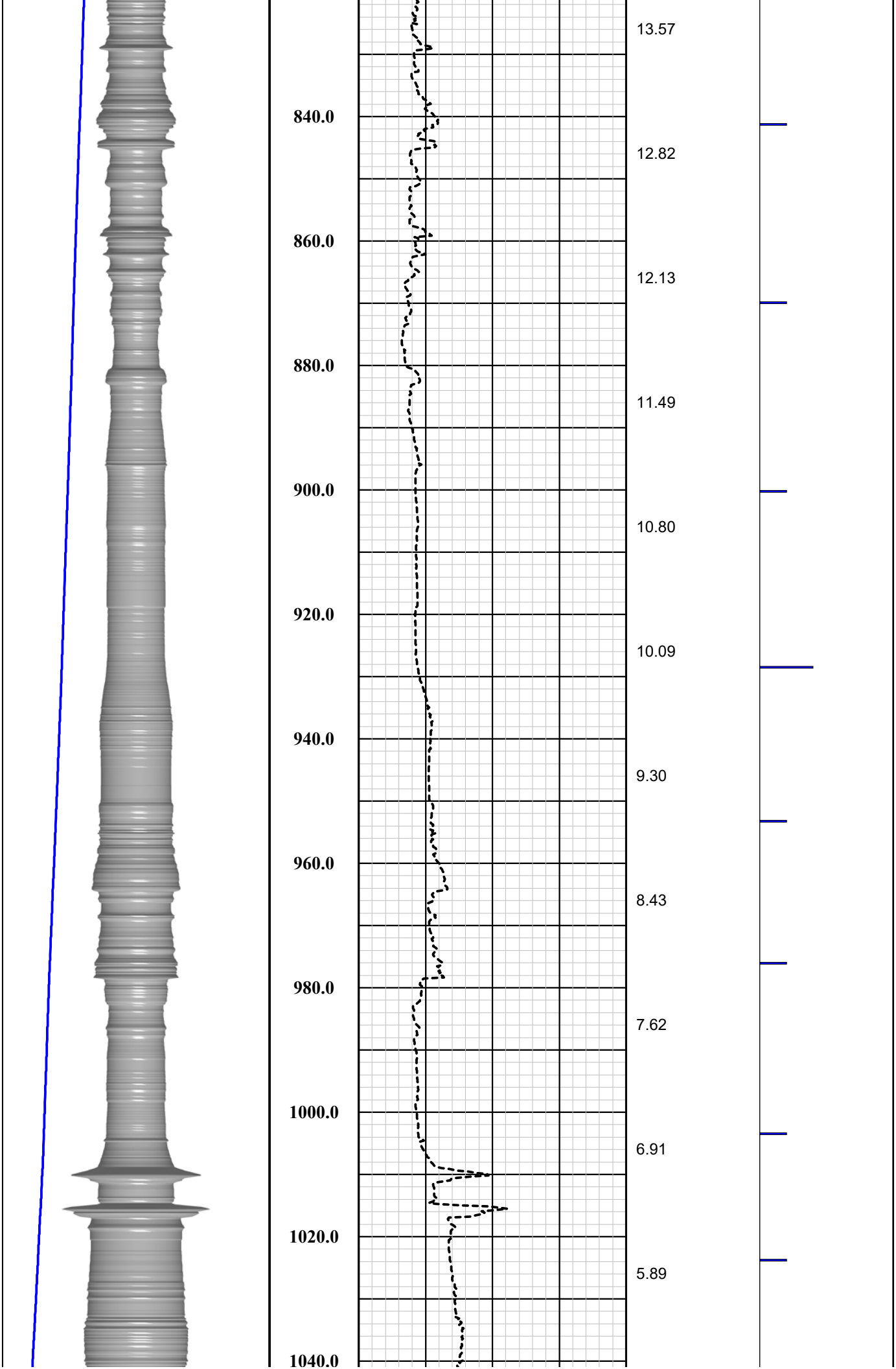
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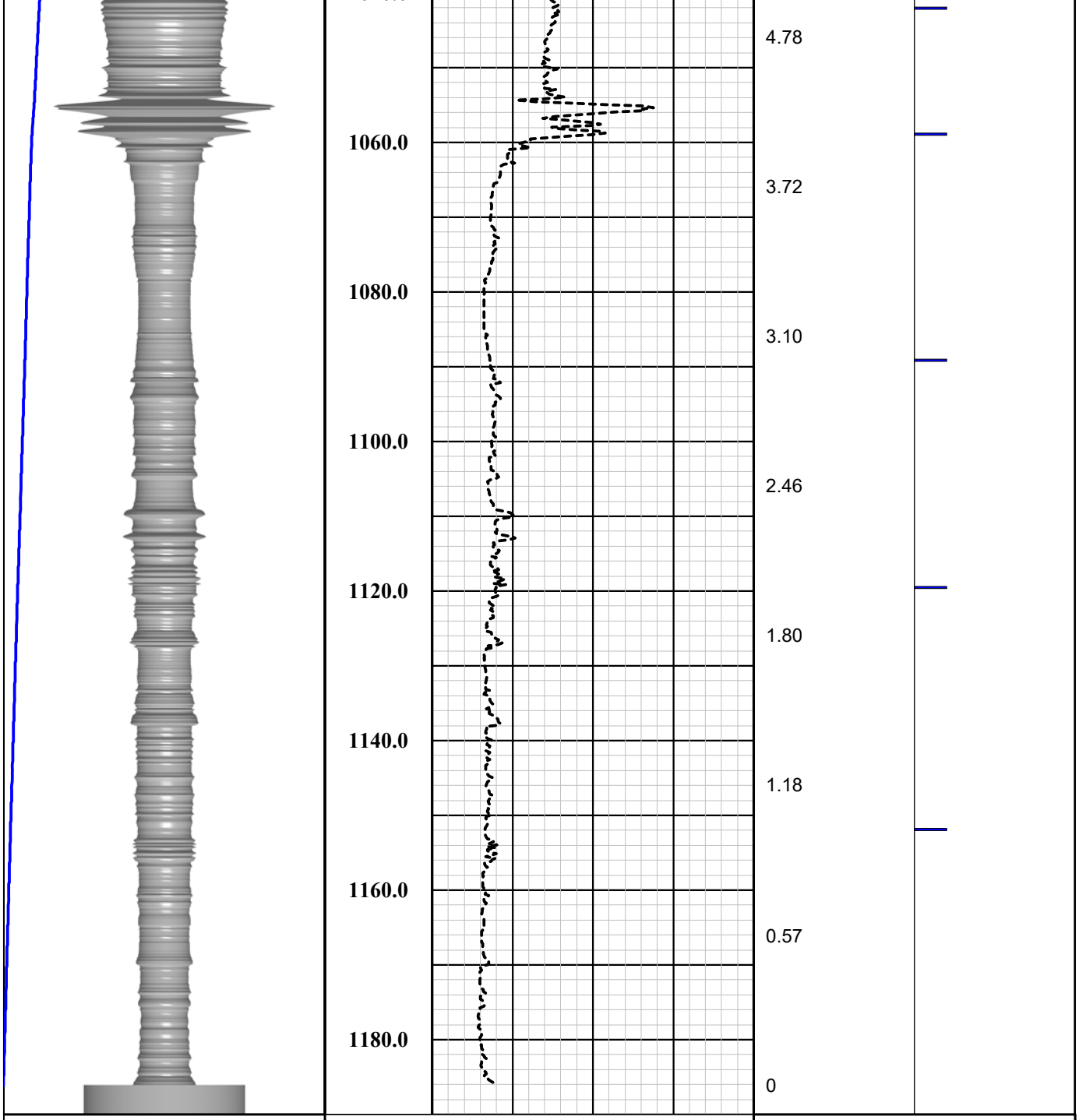


QL40 Gamma-Caliper-Temperature-Fluid Conductivity

Probe Top = Depth Ref.

Tool SN: 5613, 5979, 6161 & 6292

Four Conductor MSI Probe Top

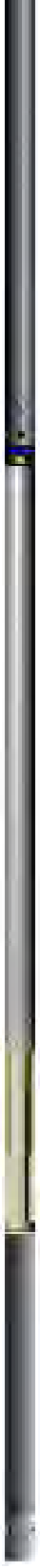
Probe Length = 3.69 m or 12.12 ft
Probe Weight = 18.195 kg or 40.11 lbs

Caliper arms can only collect data logging up hole

Caliper arms can only collect data logging up hole

Fluid Temperature/Conductivity and Natural Gamma can be collected logging up and down hole

Temperature Rating: 80 Deg C (176 Deg F)
Presure Rating: 200 bar (2900 psi)



Natural Gamma Ray = 1.07 m (42.12 in)

3-Arm Caliper = 1.78 m (70.27 in)

Available Arm Sizes: 3", 9", and 15"

FTC (Fluid Temperature/Conductivity) = 0.78 m (30.71 in)

1.57" or 40.0 mm Diameter

Southwest Exploration Services, LLC
borehole geophysics & video services

Company	FLORENCE COPPER COMPANY
Well	R-05
Field	FLORENCE COPPER
County	PINAL
State	ARIZONA

Final Caliper w/ Volume Calculation Summary

Drift Report

Wellbore DRIFT Interpretation

PREPARED ESPECIALLY FOR

FLORENCE COPPER

R-05

Wednesday - November 29, 2017

Southwest Exploration Services, LLC
borehole geophysics and video services

This Wellbore Interpretation Package represents our best efforts to provide a correct interpretation. Nevertheless, since all interpretations are opinions based on inferences from electrical or other types of measurements, we cannot and do not guarantee the accuracy or correctness of any interpretation, and we shall not be liable or responsible for any loss, costs, damages, or expenses incurred or sustained by Customer resulting from any interpretation made by this document. We do not warrant or guarantee the accuracy of the data, specifically including (but without limitations) the accuracy of data transmitted by electronic process, and we will not be responsible for accidental or intentional interception of such data by third parties. Our employees are not empowered to change or otherwise modify the attached interpretation. Furthermore, along with Eagle Pro Software we do not warrant or guarantee the accuracy of the programming techniques employed to produce this document. By accepting this Interpretation Package, the Customer agrees to the foregoing, and to our General Terms and Conditions.

Southwest Exploration Services, LLC
(480) 926-4558

WELLBORE DRIFT INTERPRETATION

Southwest Exploration Services, LLC

(480) 926-4558

Company: FLORENCE COPPER **Well Owner:**

County: PINAL **State:** Arizona **Country:** United States

Well Number: R-05 **Survey Date:** Wednesday - November 29, 2017 **Magnetic Declination:** Declination Correction Not Used

Field: FLORENCE COPPER **Drift Calculation Methodology:** Balanced Tangential Method

Location:

Remarks:

Witness: SCOTT - H&A **Vehicle No.:** 900 **Invoice No.:** **Operator:** A. OLSON **Well Depth:** 500 Feet **Casing size:** 20 Inches

Tool: Compass - 6002 **Lat.:** **Long.:** **Sec.:** **Twp.:** **Rge.:**

MEASURED DATA			DATA COMPUTATIONS						
DEPTHS, feet	INCLINATIONS, degrees	AZIMUTHS, degrees	TVD, feet	T. LATITUDE, feet	T. LONGITUDE, feet	DOGLEG SEV., degrees per 20 Feet	DOGLEG SEV., degrees per 100 feet	DRIFT DIST., feet	DRIFT BGR., degrees
0	1.96	158.42	0.00						
20	1.38	245.81	19.99	-0.417	-0.094	1.00	1.97	0.43' (5.16")	192.70
40	0.55	064.06	39.98	-0.474	-0.227	0.41	2.86	0.53' (6.36")	205.60
60	1.45	052.25	59.97	-0.277	0.059	0.96	0.29	0.28' (3.36")	167.90
80	0.46	039.83	79.96	-0.060	0.311	0.84	0.31	0.32' (3.84")	101.00
100	0.31	051.48	99.96	0.035	0.405	0.42	0.29	0.41' (4.92")	085.00
120	0.89	070.94	119.95	0.119	0.594	0.13	0.48	0.61' (7.32")	078.60
140	1.10	053.21	139.94	0.285	0.895	0.43	0.44	0.94' (11.28")	072.30
160	0.22	030.87	159.93	0.433	1.068	0.83	0.55	1.15' (13.80")	067.90
180	0.46	040.14	179.92	0.527	1.139	0.95	0.23	1.26' (15.12")	065.20
200	0.17	039.11	199.91	0.611	1.209	0.37	0.03	1.36' (16.32")	063.20
220	0.26	080.48	219.90	0.642	1.272	1.00	1.01	1.43' (17.16")	063.20
240	0.34	081.16	239.89	0.659	1.375	1.00	0.02	1.52' (18.24")	064.40
260	0.33	086.86	259.88	0.671	1.491	0.34	0.14	1.64' (19.68")	065.80
280	0.40	160.78	279.87	0.608	1.571	0.93	1.72	1.69' (20.28")	068.80
300	0.77	134.30	299.86	0.448	1.690	0.78	0.65	1.75' (21.00")	075.10
320	0.78	231.89	319.85	0.270	1.679	0.53	2.15	1.70' (20.40")	080.90
340	0.23	225.88	339.84	0.158	1.543	0.00	0.15	1.55' (18.60")	084.20

True Vertical Depth: 499.76' **Final Drift Distance:** 1.65' (19.80") **Final Drift Bearing:** 93.70°

Note: Magnetic Declination is not used because it is not a factor in the calculation of well drift or alignment. Magnetic Declination is only important if attempting to hit a target or miss another well and then it is included in the calculations.

WELLBORE DRIFT INTERPRETATION

Southwest Exploration Services, LLC
(480) 926-4558

R-05

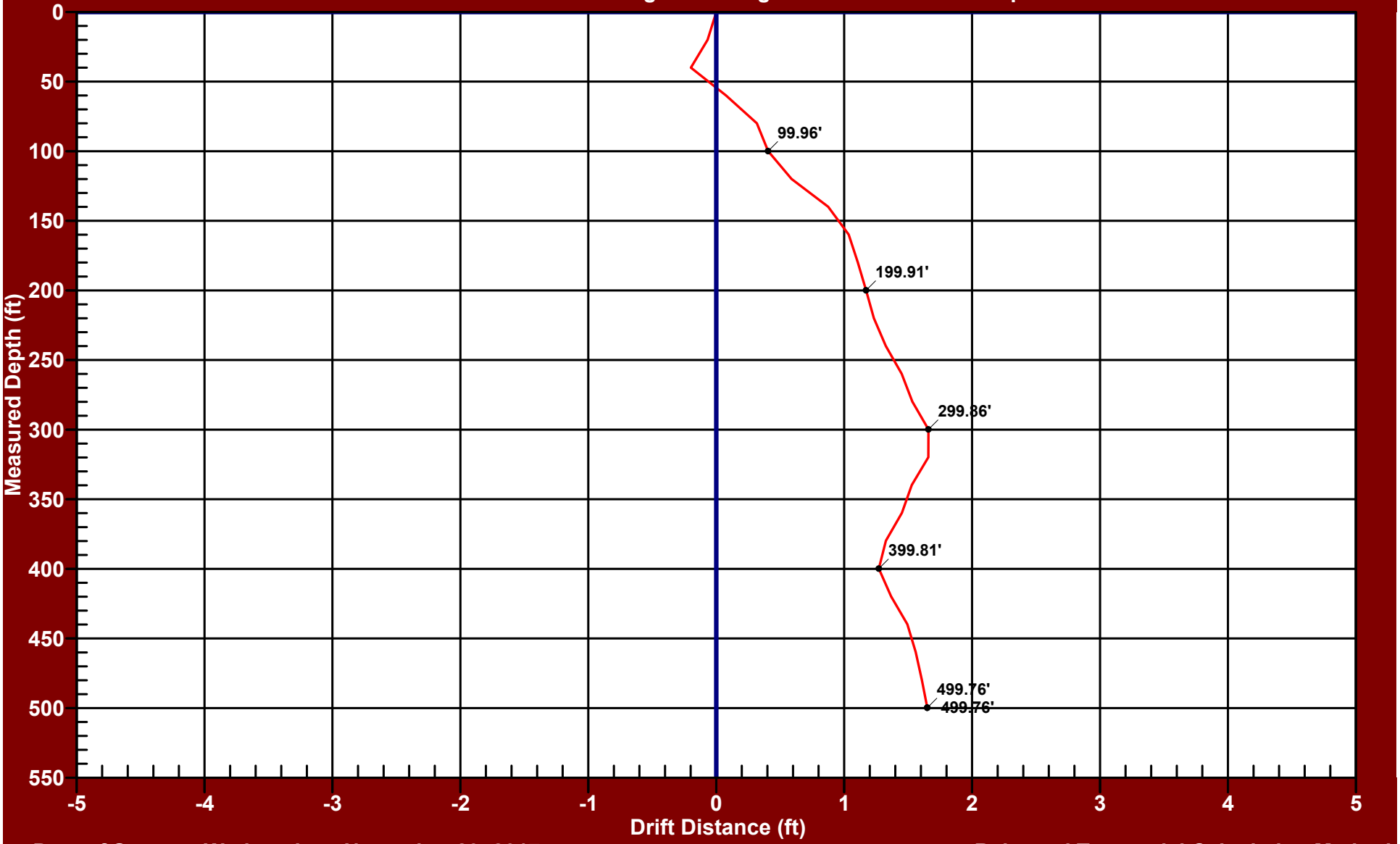
MEASURED DATA			DATA COMPUTATIONS						
DEPTHS, feet	INCLINATIONS, degrees	AZIMUTHS, degrees	TVD, feet	T. LATITUDE, feet	T. LONGITUDE, feet	DOGLEG SEV., degrees per 20 Feet	DOGLEG SEV., degrees per 100 feet	DRIFT DIST., feet	DRIFT BRG., degrees
360	0.52°	220.96°	359.83	0.062	1.455	0.56	0.12	1.46' (17.52")	087.60
380	0.39°	285.12°	379.82	0.011	1.330	0.73	1.52	1.33' (15.96")	089.50
400	0.24°	020.05°	399.81	0.068	1.279	0.88	2.11	1.28' (15.36")	087.00
420	0.60°	058.10°	419.80	0.163	1.382	0.20	0.93	1.39' (16.68")	083.30
440	0.29°	137.53°	439.79	0.181	1.505	0.97	1.83	1.52' (18.24")	083.10
460	0.39°	151.00°	459.78	0.084	1.572	0.96	0.34	1.57' (18.84")	086.90
480	0.19°	169.81°	479.77	-0.008	1.611	0.12	0.47	1.61' (19.32")	090.30
500	0.43°	153.87°	499.76	-0.108	1.650	0.81	0.40	1.65' (19.80")	093.70

Page No. 2 **True Vertical Depth: 499.76'** **Final Drift Distance: 1.65' (19.80")** **Final Drift Bearing: 93.70°**

PLANE OF DRIFT VIEW - R-05

FLORENCE COPPER

Drift Distance = 1.65 Feet Drift Bearing = 93.7 Degrees True Vertical Depth = 499.76 Feet



Date of Survey: Wednesday - November 29, 2017

Balanced Tangential Calculation Method

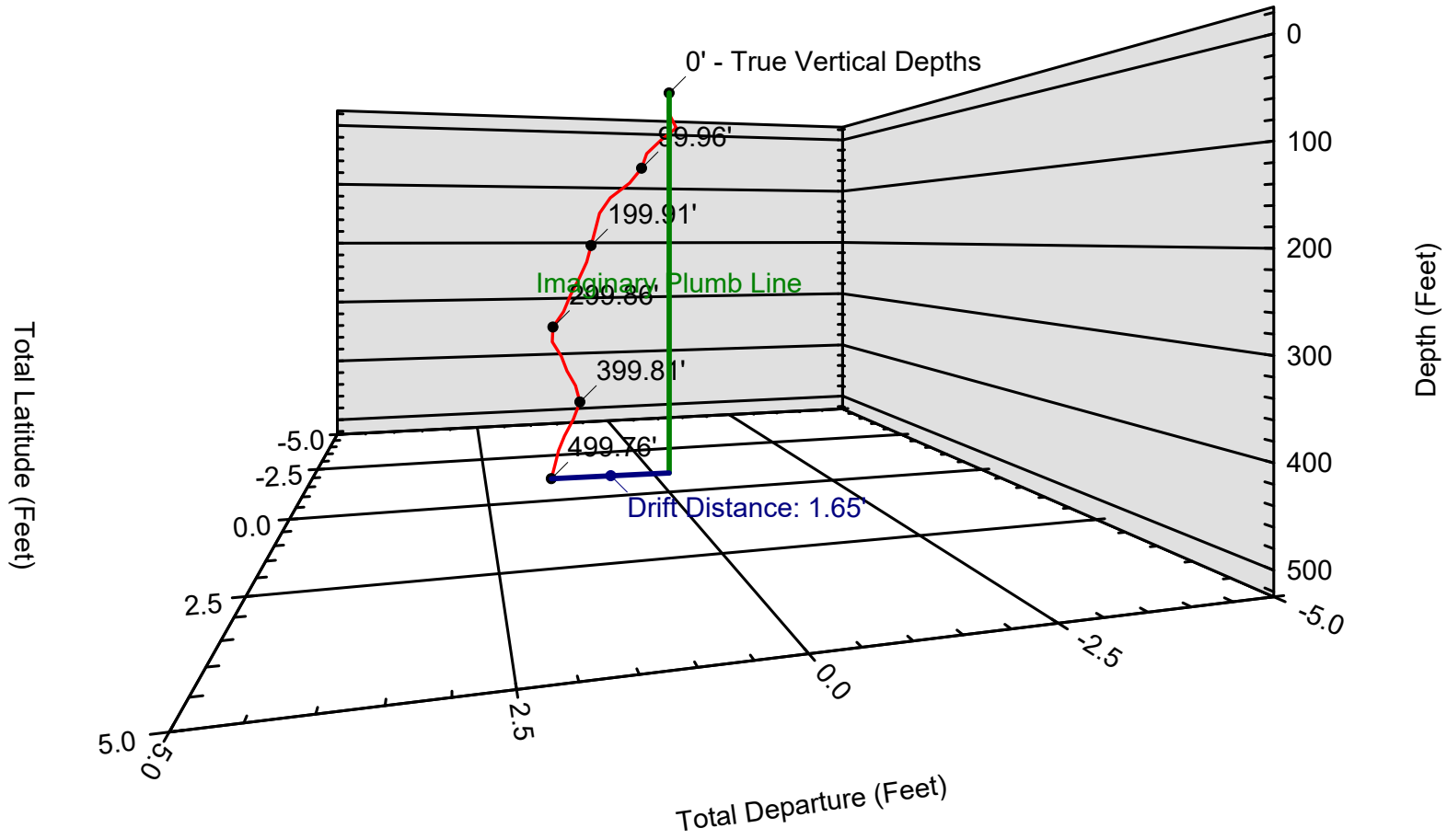
Southwest Exploration Services, LLC (480) 926-4558

3D PROJECTION VIEW - R-05

FLORENCE COPPER

Drift Distance = 1.65 Feet Drift Bearing = 93.7 Degrees True Vertical Depth = 499.76 Feet

346.0



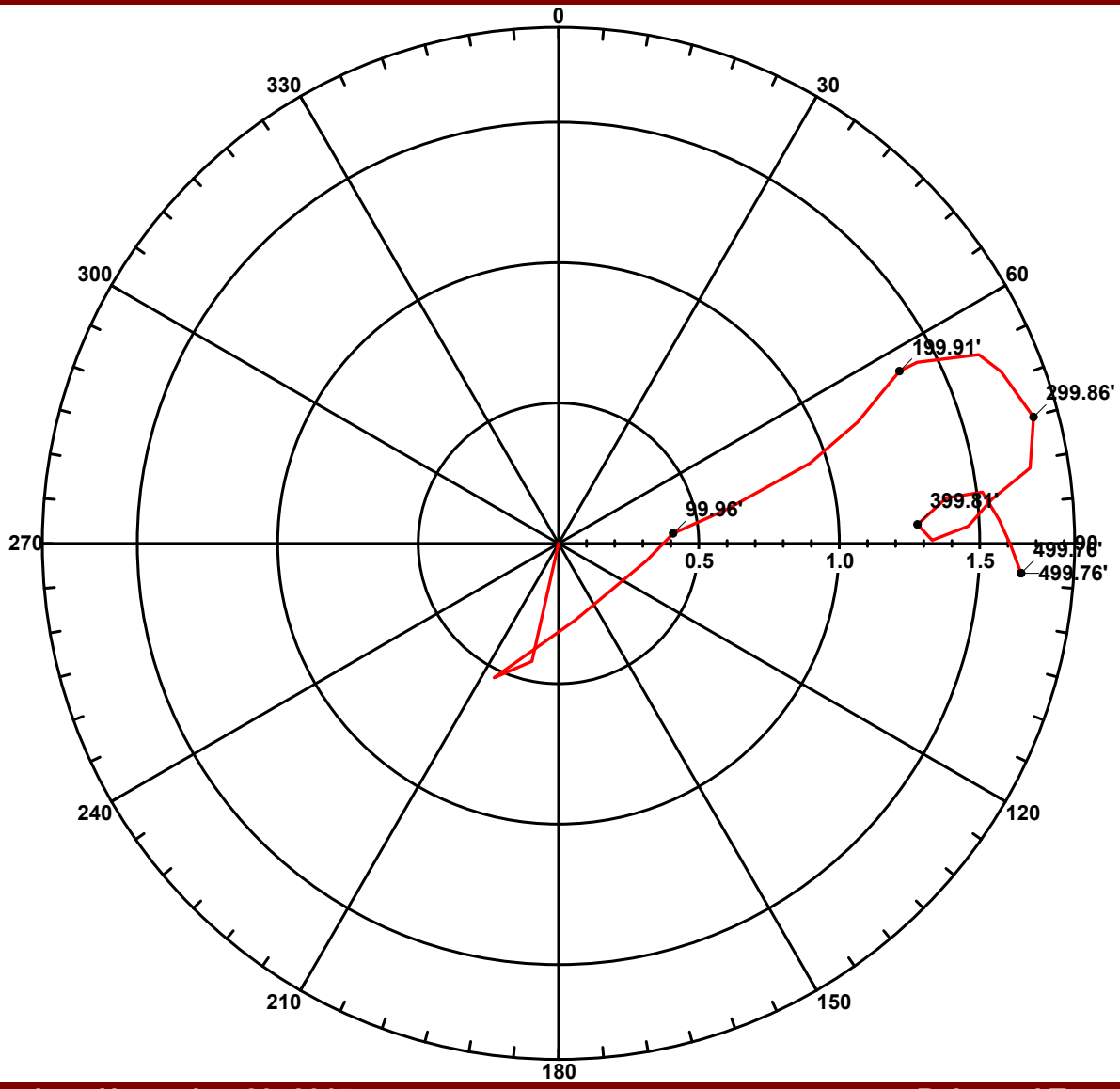
Date of Survey: Wednesday - November 29, 2017 **Balanced Tangential Calculation Method**

Southwest Exploration Services, LLC (480) 926-4558

POLAR VIEW - R-05

FLORENCE COPPER

Drift Distance = 1.65 Feet Drift Bearing = 93.7 Degrees True Vertical Depth = 499.76 Feet



Date of Survey: Wednesday - November 29, 2017

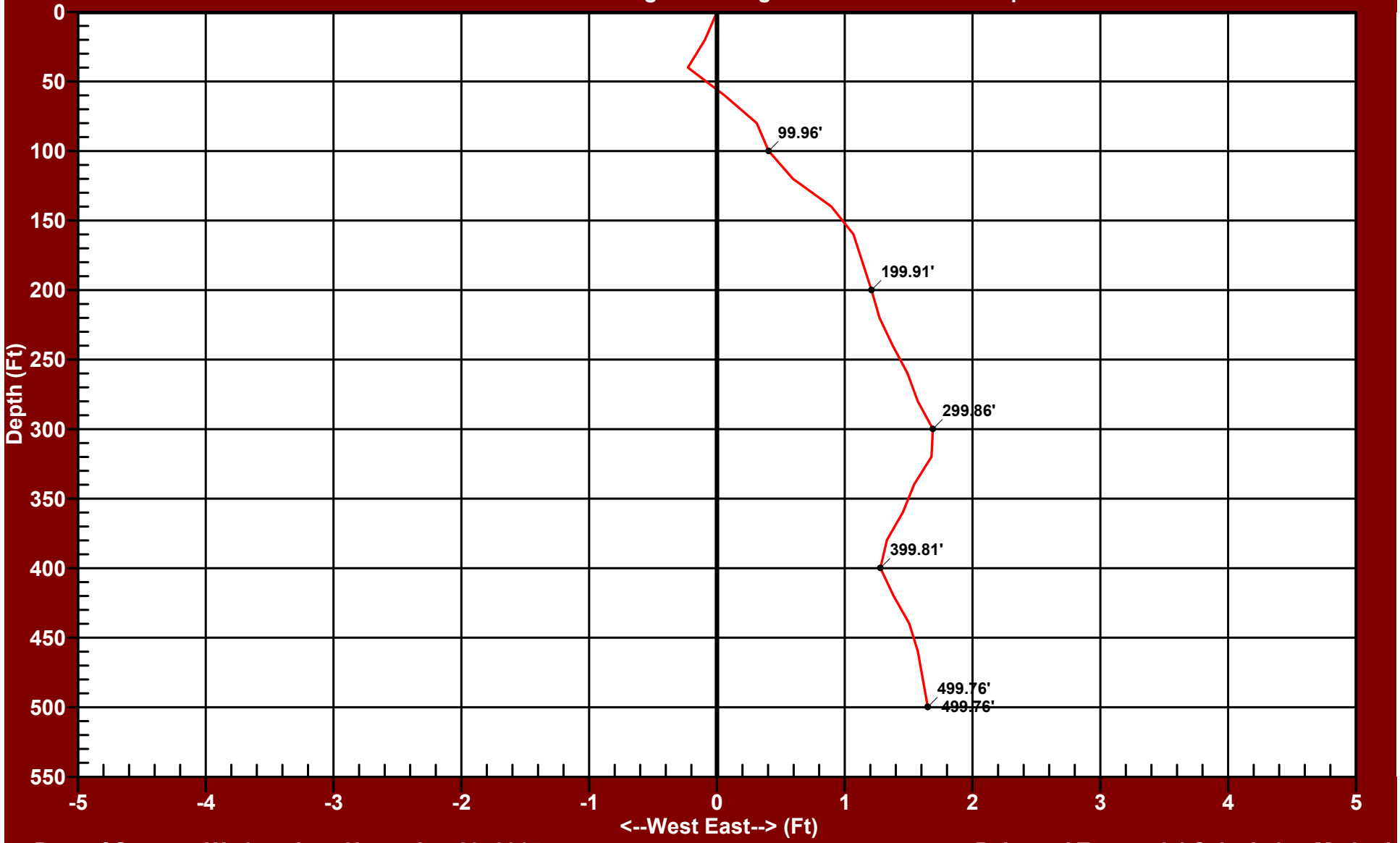
Balanced Tangential Calculation Method

Southwest Exploration Services, LLC (480) 926-4558

EASTING RECTANGULAR VIEW - R-05

FLORENCE COPPER

Drift Distance = 1.65 Feet Drift Bearing = 93.7 Degrees True Vertical Depth = 499.76 Feet



Date of Survey: Wednesday - November 29, 2017

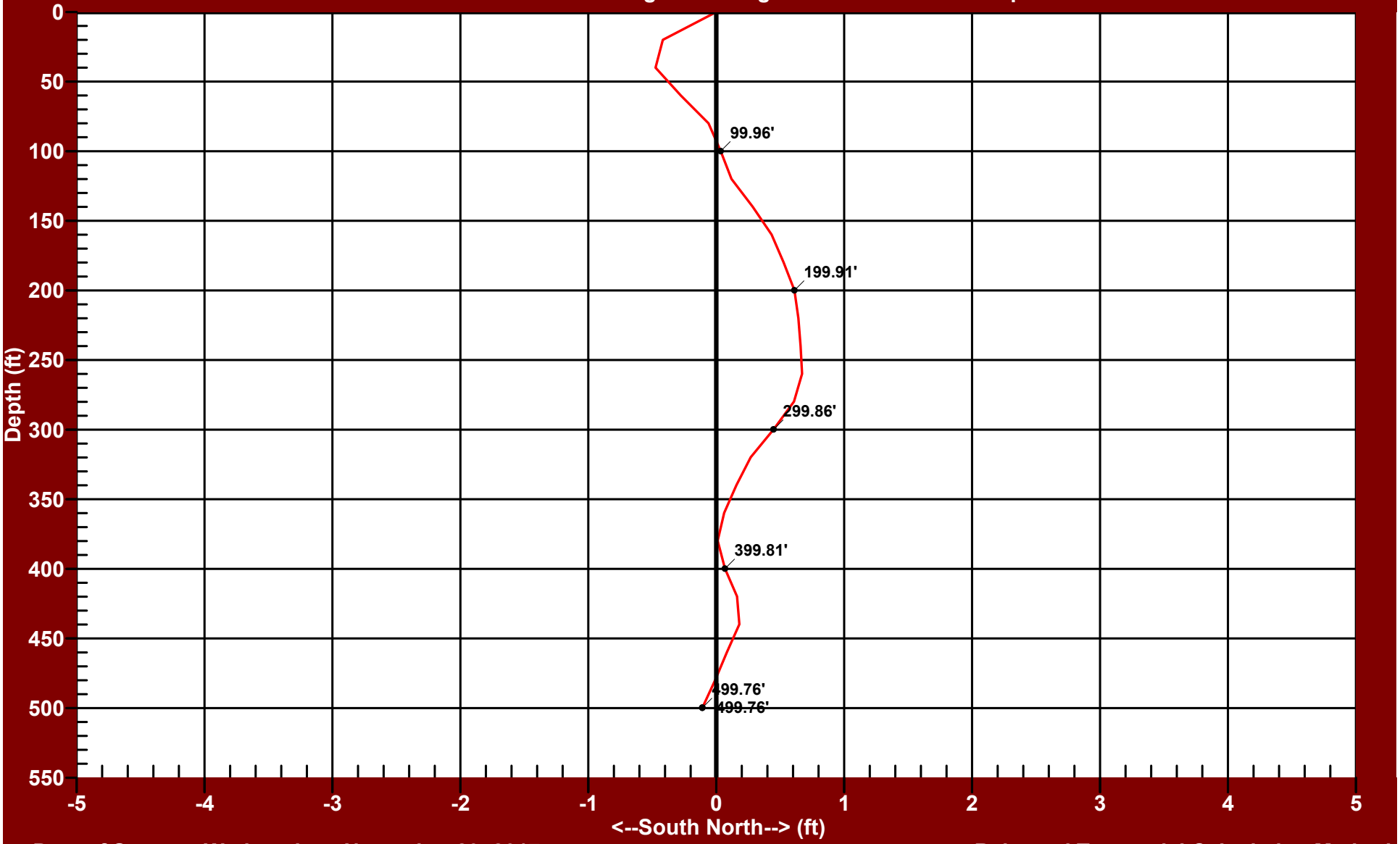
Balanced Tangential Calculation Method

Southwest Exploration Services, LLC (480) 926-4558

NORTHING RECTANGULAR VIEW - R-05

FLORENCE COPPER

Drift Distance = 1.65 Feet Drift Bearing = 93.7 Degrees True Vertical Depth = 499.76 Feet



Date of Survey: Wednesday - November 29, 2017

Balanced Tangential Calculation Method

Southwest Exploration Services, LLC (480) 926-4558

Drift Report

Wellbore DRIFT Interpretation

PREPARED ESPECIALLY FOR

FLORENCE COPPER COMPANY and FLORENCE COPPER COMPANY

R-05

Friday - February 2, 2018

Southwest Exploration Services, LLC

borehole geophysics and video services

This Wellbore Interpretation Package represents our best efforts to provide a correct interpretation. Nevertheless, since all interpretations are opinions based on inferences from electrical or other types of measurements, we cannot and do not guarantee the accuracy or correctness of any interpretation, and we shall not be liable or responsible for any loss, costs, damages, or expenses incurred or sustained by Customer resulting from any interpretation made by this document. We do not warrant or guarantee the accuracy of the data, specifically including (but without limitations) the accuracy of data transmitted by electronic process, and we will not be responsible for accidental or intentional interception of such data by third parties. Our employees are not empowered to change or otherwise modify the attached interpretation. Furthermore, along with Eagle Pro Software we do not warrant or guarantee the accuracy of the programming techniques employed to produce this document. By accepting this Interpretation Package, the Customer agrees to the foregoing, and to our General Terms and Conditions.

Southwest Exploration Services, LLC
(480) 926-4558

WELLBORE DRIFT INTERPRETATION

Southwest Exploration Services, LLC

(480) 926-4558

Company: FLORENCE COPPER COMPANY **Well Owner:** FLORENCE COPPER COMPANY

County: PINAL **State:** Arizona **Country:**

Well Number: R-05 **Survey Date:** Friday - February 2, 2018 **Magnetic Declination:** Declination Correction Not Used

Field: FLORENCE COPPER **Drift Calculation Methodology:** Balanced Tangential Method

Location: FLORENCE JUNCTION AREA

Remarks: QL-DEVIATION-MAGNETIC

Witness: HALEY & ALDRICH **Vehicle No.:** 800 **Invoice No.:** **Operator:** K. MITCHELL **Well Depth:** 1200 Feet **Casing size:** 8 Inches

Tool: Compass - 142201 **Lat.:** **Long.:** **Sec.:** **Twp.:** **Rge.:**

MEASURED DATA			DATA COMPUTATIONS				
DEPTHS, feet	INCLINATIONS, degrees	AZIMUTHS, degrees	TVD, feet	T. LATITUDE, feet	T. LONGITUDE, feet	DRIFT DIST., feet	DRIFT BGR., degrees
500	0.70	054.90	500.00				
520	0.30	223.20	519.99	0.032	0.064	0.07' (.84")	063.40
540	0.20	222.70	539.98	-0.032	0.004	0.03' (.36")	172.00
560	0.30	205.00	559.97	-0.105	-0.042	0.11' (1.32")	201.70
580	0.30	198.70	579.96	-0.202	-0.081	0.22' (2.64")	201.80
600	0.20	193.00	599.95	-0.286	-0.106	0.30' (3.60")	200.30
620	0.20	078.10	619.94	-0.313	-0.080	0.32' (3.84")	194.30
640	0.20	104.20	639.93	-0.314	-0.012	0.31' (3.72")	182.20
660	0.40	082.60	659.92	-0.314	0.091	0.33' (3.96")	163.80
680	0.40	100.00	679.91	-0.317	0.229	0.39' (4.68")	144.20
700	0.70	121.10	699.90	-0.392	0.402	0.56' (6.72")	134.30
720	0.40	118.90	719.89	-0.489	0.568	0.75' (9.00")	130.70
740	0.50	119.40	739.88	-0.566	0.705	0.90' (10.80")	128.70
760	0.80	133.80	759.87	-0.705	0.882	1.13' (13.56")	128.70
780	0.60	117.20	779.86	-0.850	1.076	1.37' (16.44")	128.30
800	0.50	112.40	799.85	-0.931	1.250	1.56' (18.72")	126.70
820	0.50	112.50	819.84	-0.998	1.411	1.73' (20.76")	125.30
840	0.80	117.50	839.83	-1.096	1.615	1.95' (23.40")	124.20

True Vertical Depth: 1199.66' **Final Drift Distance:** 8.06' (96.72") **Final Drift Bearing:** 141.40°

Note: Magnetic Declination is not used because it is not a factor in the calculation of well drift or alignment. Magnetic Declination is only important if attempting to hit a target or miss another well and then it is included in the calculations.

WELLBORE DRIFT INTERPRETATION

Southwest Exploration Services, LLC

R-05

(480) 926-4558

MEASURED DATA			DATA COMPUTATIONS				
DEPTHS, feet	INCLINATIONS, degrees	AZIMUTHS, degrees	TVD, feet	T. LATITUDE, feet	T. LONGITUDE, feet	DRIFT DIST., feet	DRIFT BRG., degrees
860	0.70°	122.20°	859.82	-1.226	1.842	2.21' (26.52")	123.60
880	0.80°	120.60°	879.81	-1.362	2.066	2.47' (29.64")	123.40
900	0.70°	132.80°	899.80	-1.516	2.276	2.73' (32.76")	123.70
920	0.80°	149.80°	919.79	-1.720	2.436	2.98' (35.76")	125.20
940	0.60°	130.20°	939.78	-1.908	2.586	3.21' (38.52")	126.40
960	0.80°	120.20°	959.77	-2.046	2.787	3.46' (41.52")	126.30
980	1.00°	136.60°	979.76	-2.243	3.028	3.77' (45.24")	126.50
1,000	1.20°	139.90°	999.76	-2.530	3.283	4.14' (49.68")	127.60
1,020	1.50°	166.60°	1,019.75	-2.945	3.479	4.56' (54.72")	130.30
1,040	1.10°	155.80°	1,039.74	-3.375	3.618	4.95' (59.40")	133.00
1,060	1.60°	137.40°	1,059.73	-3.756	3.886	5.40' (64.80")	134.00
1,080	1.50°	155.40°	1,079.72	-4.200	4.184	5.93' (71.16")	135.10
1,100	1.20°	149.30°	1,099.71	-4.618	4.400	6.38' (76.56")	136.40
1,120	1.10°	141.60°	1,119.70	-4.949	4.626	6.77' (81.24")	136.90
1,140	0.80°	189.30°	1,139.69	-5.237	4.723	7.05' (84.60")	138.00
1,160	1.00°	154.80°	1,159.68	-5.533	4.775	7.31' (87.72")	139.20
1,180	1.10°	164.10°	1,179.67	-5.876	4.902	7.65' (91.80")	140.20
1,200	1.40°	162.40°	1,199.66	-6.294	5.028	8.06' (96.72")	141.40

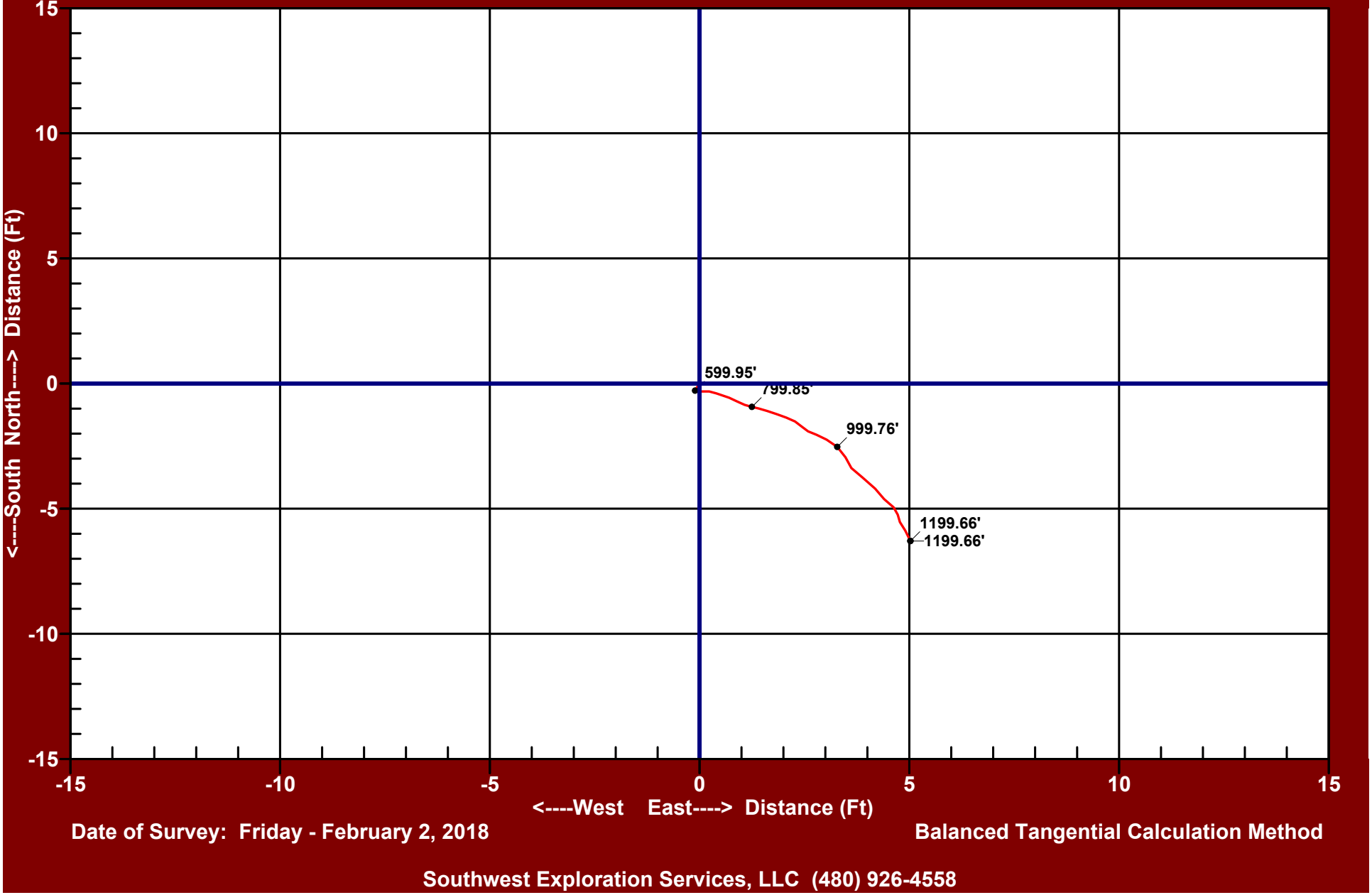
Page No. 2 **True Vertical Depth: 1199.66'** **Final Drift Distance: 8.06' (96.72")** **Final Drift Bearing: 141.40°**

PLAN VIEW - R-05

FLORENCE COPPER COMPANY

FLORENCE COPPER COMPANY

Drift Distance = 8.06 Feet Drift Bearing = 141.4 Degrees True Vertical Depth = 1199.66 Feet



Date of Survey: Friday - February 2, 2018

Balanced Tangential Calculation Method

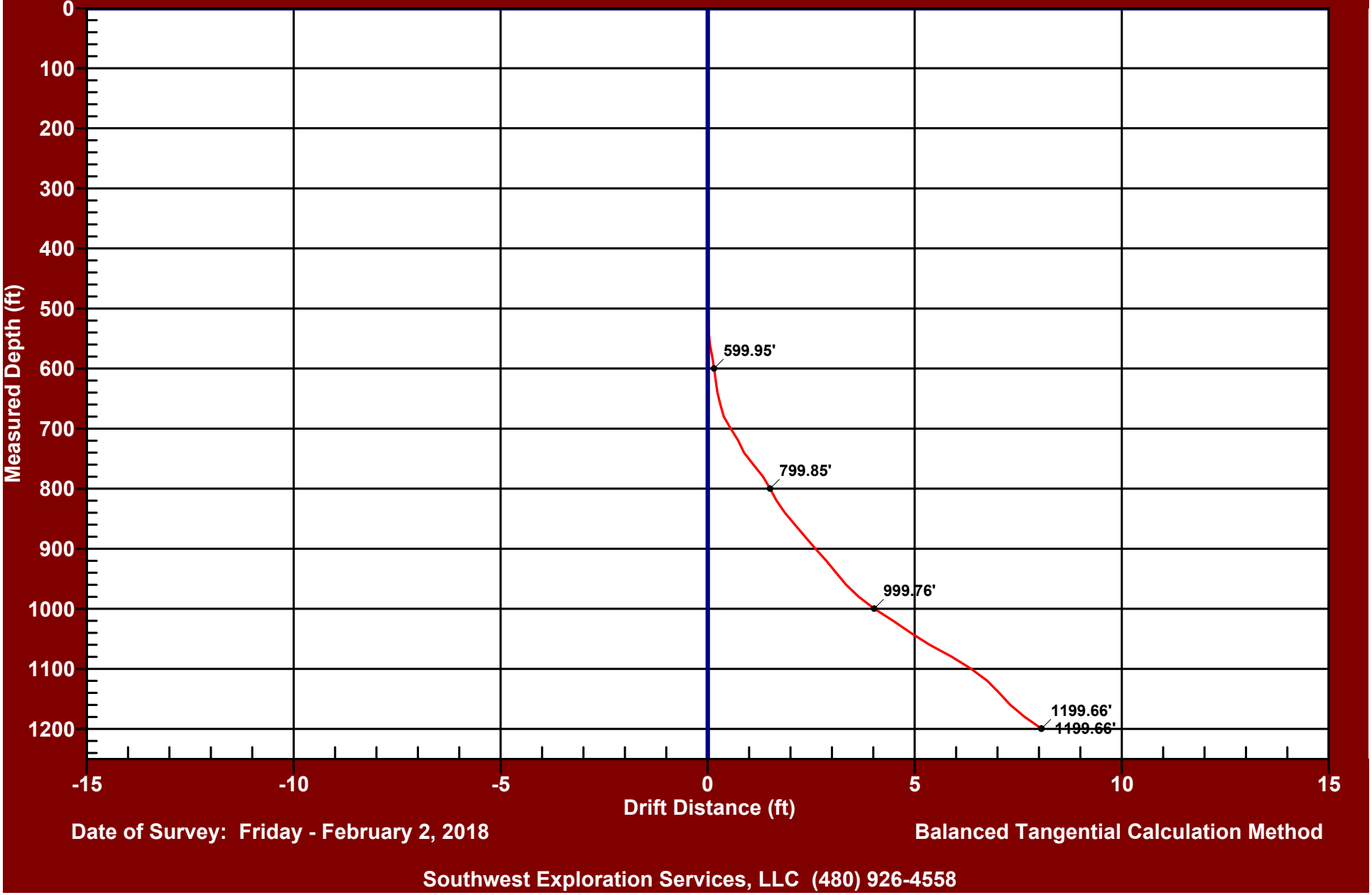
Southwest Exploration Services, LLC (480) 926-4558

PLANE OF DRIFT VIEW - R-05

FLORENCE COPPER COMPANY

FLORENCE COPPER COMPANY

Drift Distance = 8.06 Feet Drift Bearing = 141.4 Degrees True Vertical Depth = 1199.66 Feet



Date of Survey: Friday - February 2, 2018

Balanced Tangential Calculation Method

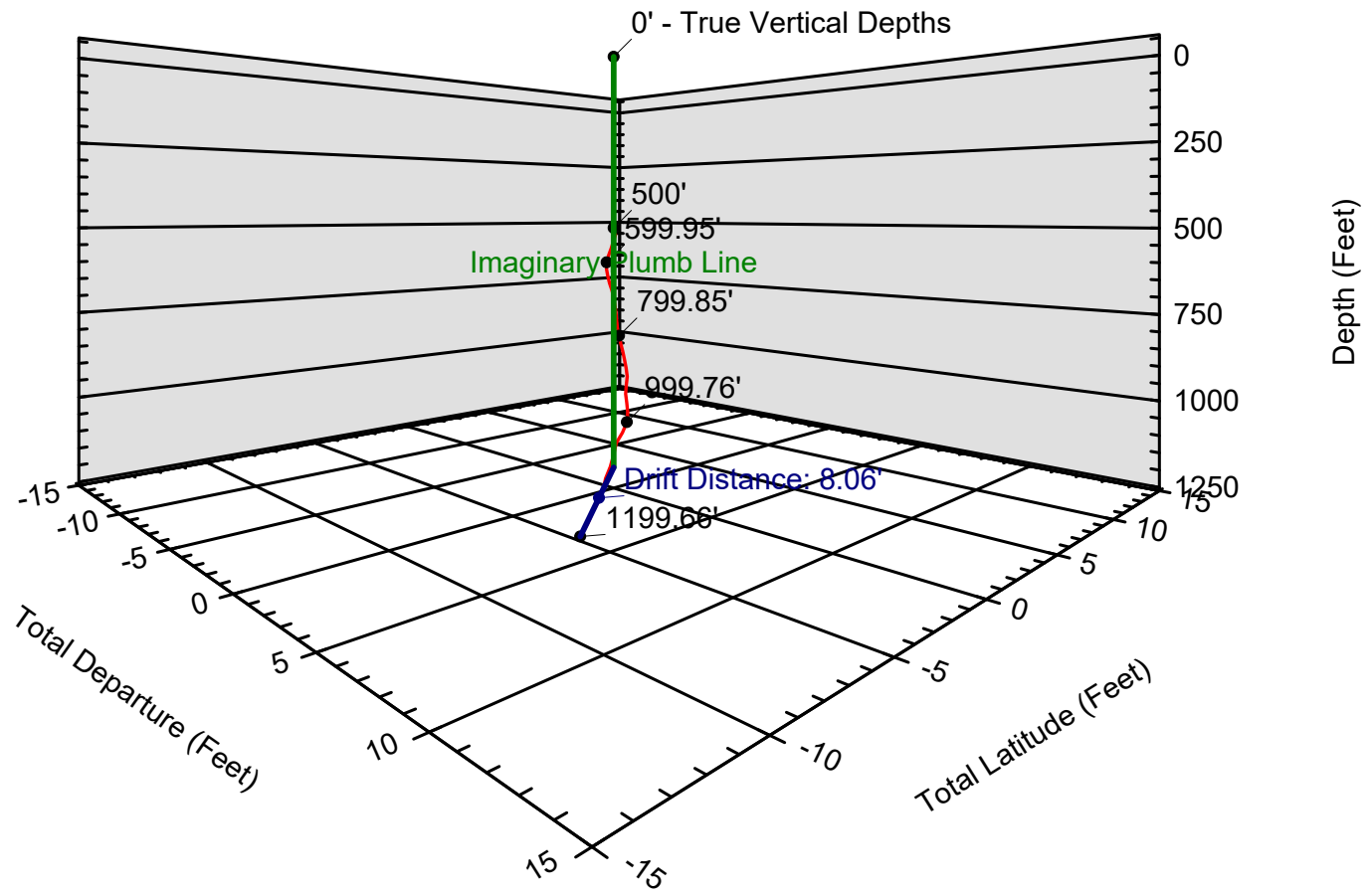
Southwest Exploration Services, LLC (480) 926-4558

3D PROJECTION VIEW - R-05

FLORENCE COPPER COMPANY
FLORENCE COPPER COMPANY

Drift Distance = 8.06 Feet **Drift Bearing = 141.4 Degrees** **True Vertical Depth = 1199.66 Feet**

226.0



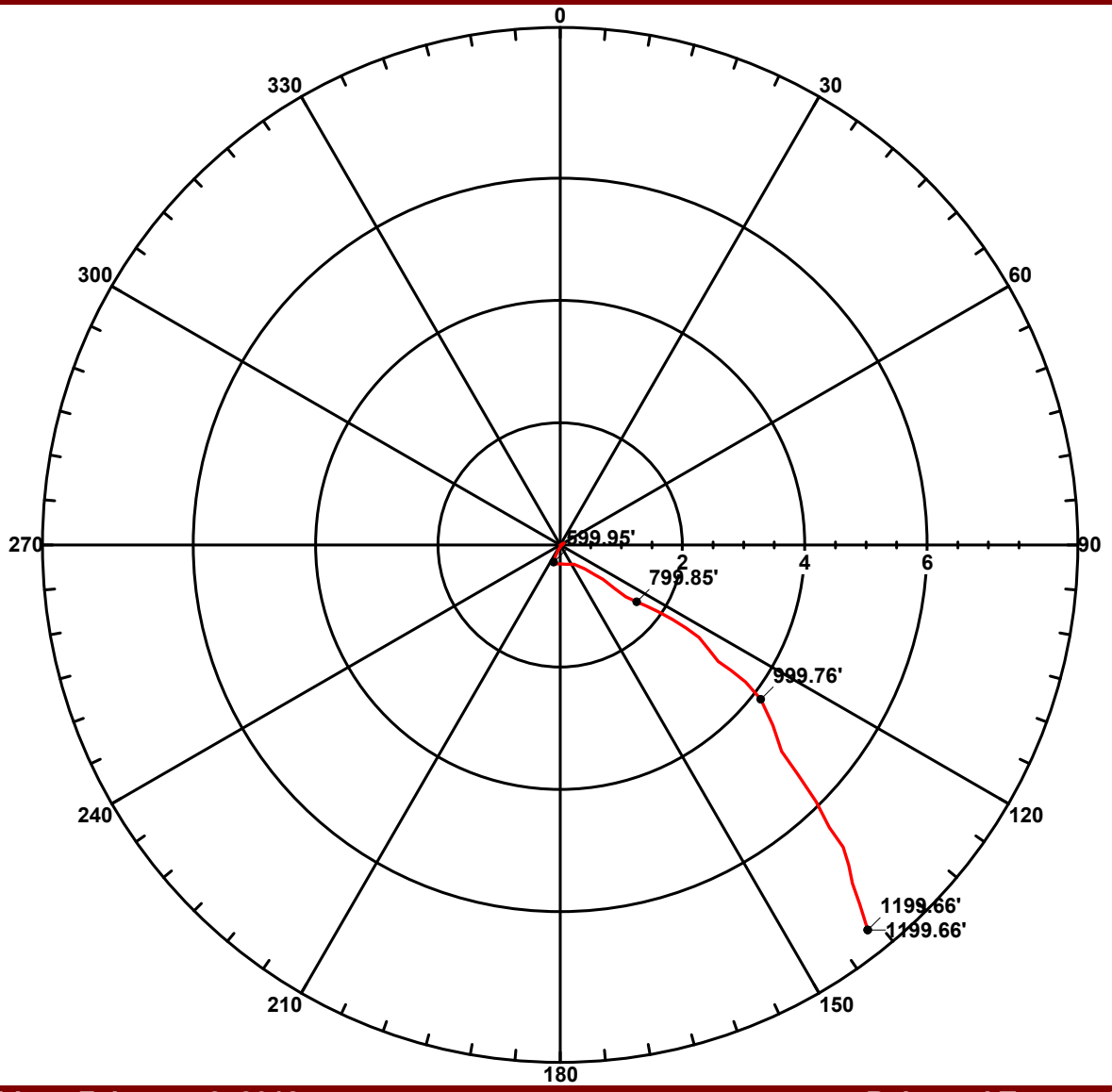
Date of Survey: Friday - February 2, 2018 **Balanced Tangential Calculation Method**

Southwest Exploration Services, LLC (480) 926-4558

POLAR VIEW - R-05

FLORENCE COPPER COMPANY
FLORENCE COPPER COMPANY

Drift Distance = 8.06 Feet Drift Bearing = 141.4 Degrees True Vertical Depth = 1199.66 Feet



Date of Survey: Friday - February 2, 2018 **Balanced Tangential Calculation Method**

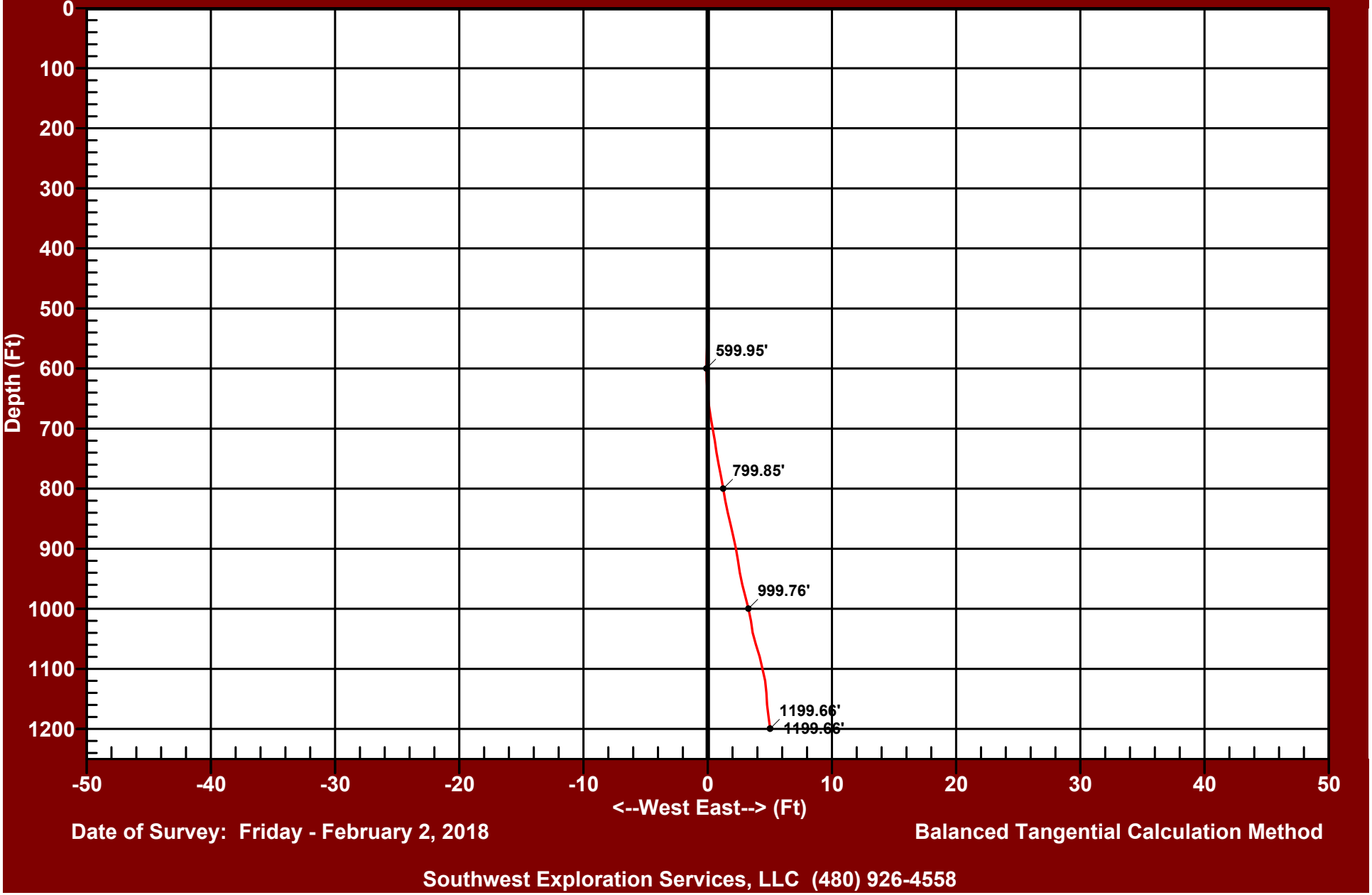
Southwest Exploration Services, LLC (480) 926-4558

EASTING RECTANGULAR VIEW - R-05

FLORENCE COPPER COMPANY

FLORENCE COPPER COMPANY

Drift Distance = 8.06 Feet Drift Bearing = 141.4 Degrees True Vertical Depth = 1199.66 Feet



Date of Survey: Friday - February 2, 2018

Balanced Tangential Calculation Method

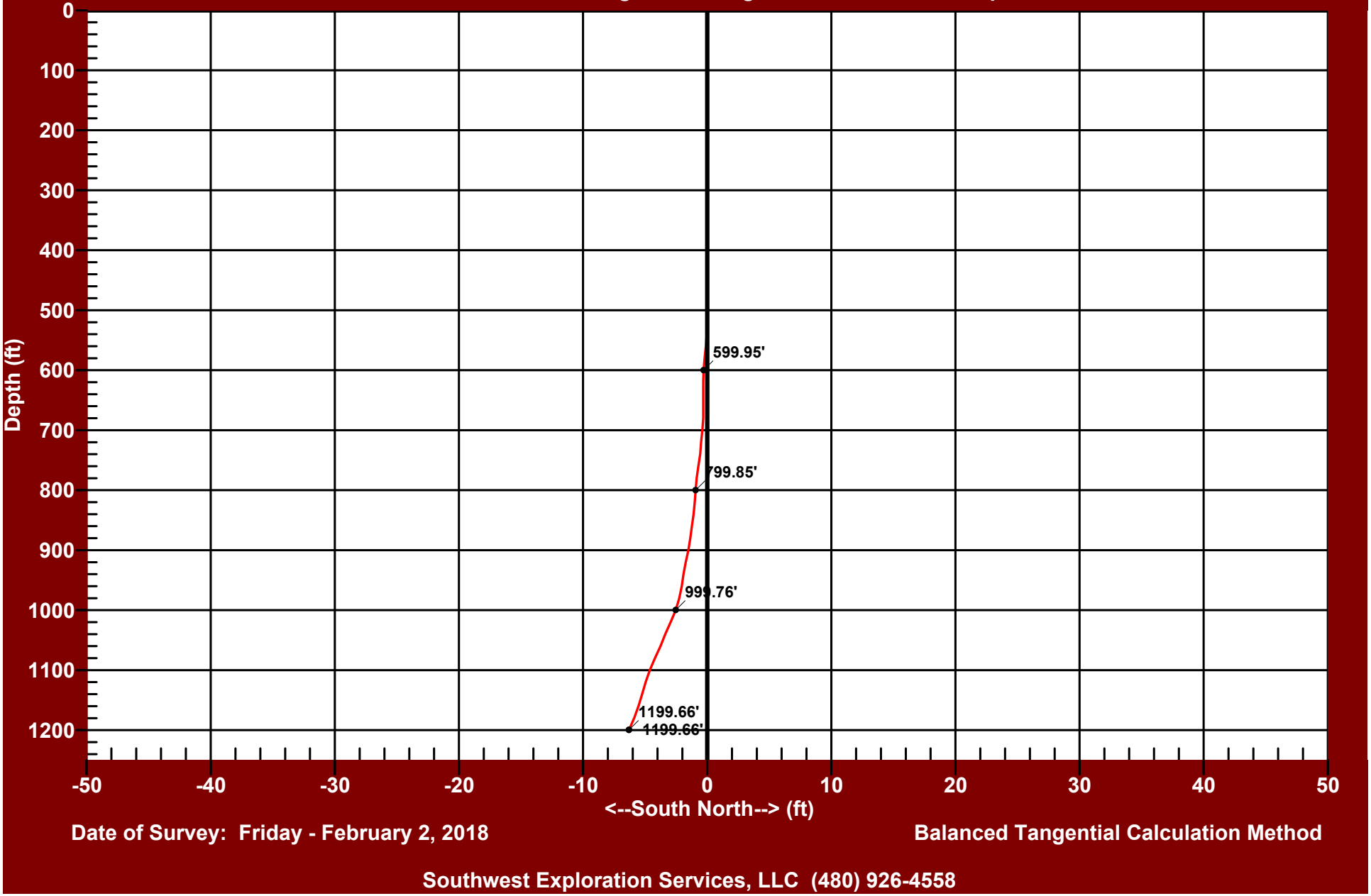
Southwest Exploration Services, LLC (480) 926-4558

NORTHING RECTANGULAR VIEW - R-05

FLORENCE COPPER COMPANY

FLORENCE COPPER COMPANY

Drift Distance = 8.06 Feet Drift Bearing = 141.4 Degrees True Vertical Depth = 1199.66 Feet



Date of Survey: Friday - February 2, 2018

Balanced Tangential Calculation Method

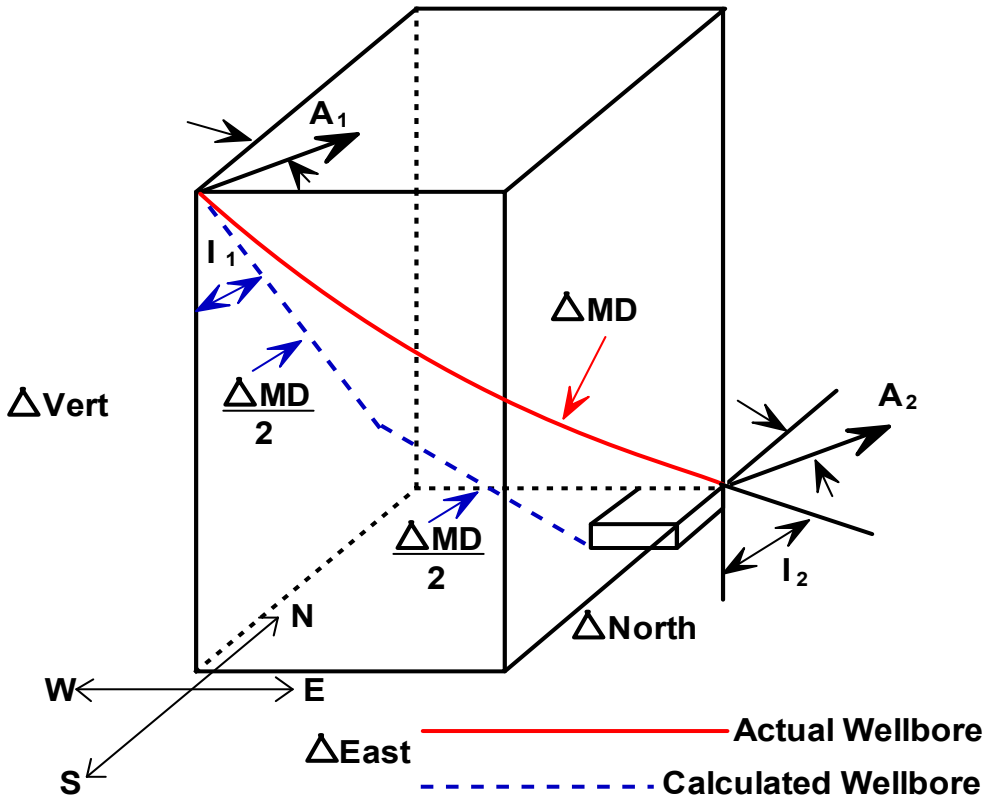
Southwest Exploration Services, LLC (480) 926-4558

METHODOLOGY

Balanced Tangential Methodology

The Balanced Tangential Method uses the inclination and direction angles at the upper and lower ends of the course length in a manner so as to balance the two sets of measured angles over a course length. From a theoretical standpoint, this method combines the trigonometric functions to provide the average balanced inclination and direction angles, which are used in standard conputational procedures. Other common names for this method are Vector Averaging, Acceleration, and Trapezoidal.

This method treats half the measured distance as being tangent to the upper inclination and azimuth values and the remainder of the measurements as being tangent to the lower inclination and azimuth values



$$\Delta North = \frac{\Delta MD}{2}\left[\sin(I_1) \times \cos(A_1) + \sin(I_2) \times \cos(A_2)\right]$$

$$\Delta East = \frac{\Delta MD}{2}\left[\sin(I_1) \times \sin(A_1) + \sin(I_2) \times \sin(A_2)\right]$$

$$\Delta Vert = \frac{\Delta MD}{2}\left[\cos(I_1) + \cos(I_2)\right]$$

Southwest Exploration Services, LLC

borehole geophysics & video services

COMPANY	FLORENCE COPPER
WELL ID	R-05
FIELD	FLORENCE COPPER
COUNTY	PINAL STATE ARIZONA

TYPE OF LOGS: GAMMA - CALIPER
MORE: TEMP. / FLUID COND.

LOCATION

SEC TWP RGE

OTHER SERVICES
SONIC
4 PI DENSITY
DUAL DENSITY

PERMANENT DATUM	ELEVATION	K.B.
LOG MEAS. FROM	GROUND LEVEL ABOVE PERM. DATUM	D.F.
DRILLING MEAS. FROM	GROUND LEVEL	G.L.

DATE	3-2-18	TYPE FLUID IN HOLE	FORMATION WATER
RUN No	1	MUD WEIGHT	N/A
TYPE LOG	GAMMA - CALIPER - FTC	VISCOSITY	N/A
DEPTH-DRILLER	1200 FT.	LEVEL	~220 FT.
DEPTH-LOGGER	1190 FT.	MAX. REC. TEMP.	30.60 DEG. C
BTM LOGGED INTERVAL	1190 FT.	IMAGE ORIENTED TO:	N/A
TOP LOGGED INTERVAL	SURFACE	SAMPLE INTERVAL	0.2 FT.
DRILLER / RIG#	HYDRO RESOURCES	LOGGING TRUCK	TRUCK #750
RECORDED BY / Logging Eng.	A. OLSON / E. TURNER	TOOL STRING/SN	QL COMBO TOOL SN 6161
WITNESSED BY	KENDRA - H&A	LOG TIME:ON SITE/OFF SITE	8:00 A.M.

RUN	BOREHOLE RECORD			CASING RECORD			
NO.	BIT	FROM	TO	SIZE	WGT.	FROM	TO
1	?	SURFACE	40 FT.	14 IN.	STEEL	SURFACE	500 FT.
2	20 IN.	40 FT.	500 FT.	5 IN.	FG	SURFACE	500 FT.
3	12 1/4 IN.	500 FT.	TOTAL DEPTH	5 IN.	PVC	500 FT.	TOTAL DEPTH

COMMENTS:

.

Tool Summary:

Date	3-2-18	**Date**	3-2-18	**Date**	3-2-18		
Run No.	1	**Run No.**	2	**Run No.**	3		
Tool Model	QL COMBO TOOL	**Tool Model**	ALT 4 RX SONIC	**Tool Model**	COMPROBE 4 PI		
Tool SN	6161	**Tool SN**	4572	**Tool SN**	6009		
From	SURFACE	**From**	200 FT.	**From**	SURFACE		
To	1190 FT.	**To**	1190 FT.	**To**	1190 FT.		
Recorded By	A. OLSON	**Recorded By**	A. OLSON	**Recorded By**	A. OLSON		
Truck No	750	**Truck No**	750	**Truck No**	750		
Operation Check	2-28-18	**Operation Check**	2-28-18	**Operation Check**	2-28-18		
Calibration Check	2-28-18	**Calibration Check**	N/A	**Calibration Check**	N/A		
Time Logged	11:50 A.M.	**Time Logged**	12:30 P.M.	**Time Logged**	1:30 P.M.		

Date	3-2-18	**Date**		**Date**			
Run No.	4	**Run No.**	5	**Run No.**	6		
Tool Model	ALT QL DENSITY	**Tool Model**		**Tool Model**			
Tool SN	6187	**Tool SN**		**Tool SN**			
From	SURFACE	**From**		**From**			
To	1190 FT.	**To**		**To**			
Recorded By	A. OLSON	**Recorded By**		**Recorded By**			
Truck No	750	**Truck No**		**Truck No**			
Operation Check	2-28-18	**Operation Check**		**Operation Check**			
Calibration Check	N/A	**Calibration Check**		**Calibration Check**			
Time Logged	2:10 P.M.	**Time Logged**		**Time Logged**			

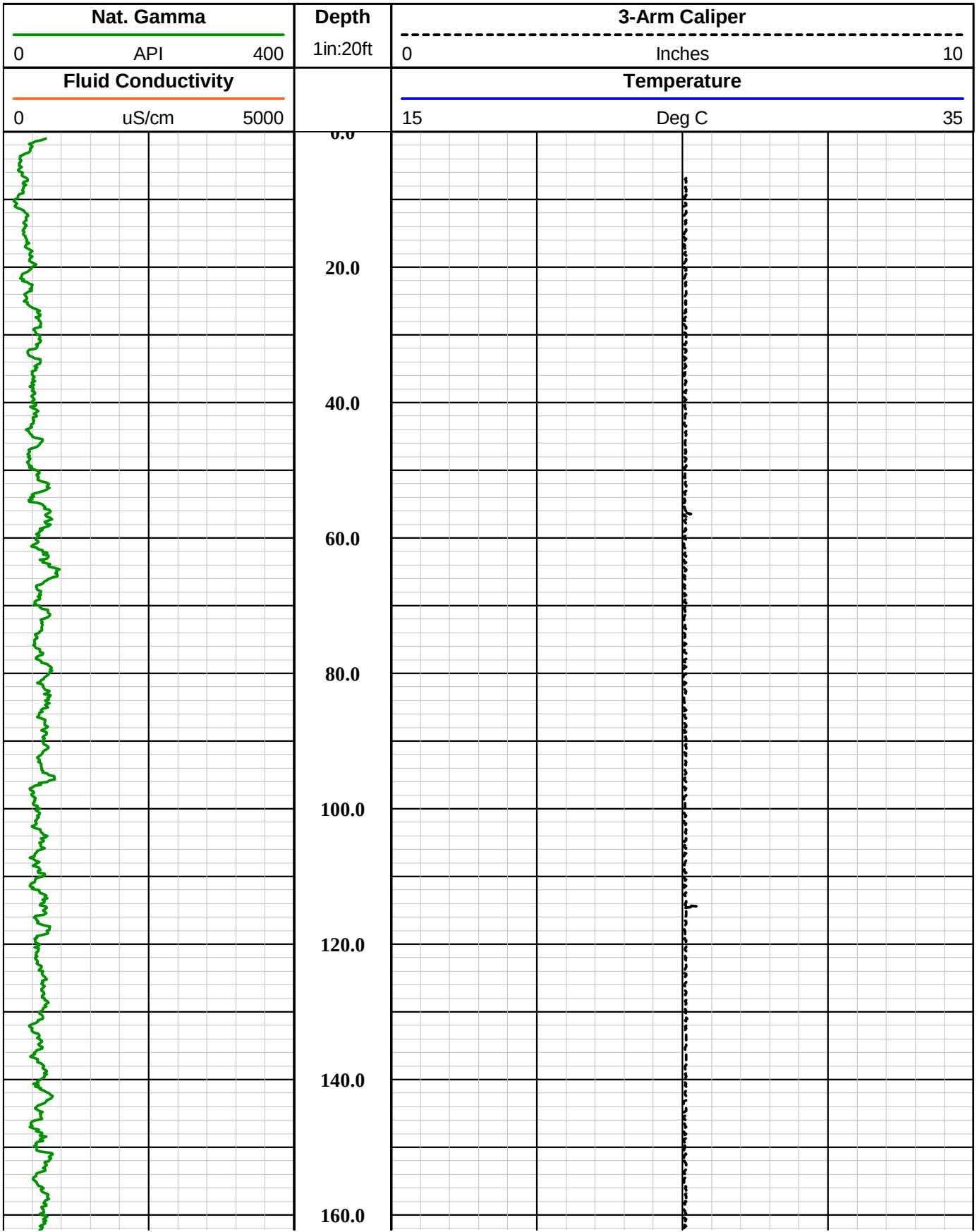
Additional Comments:

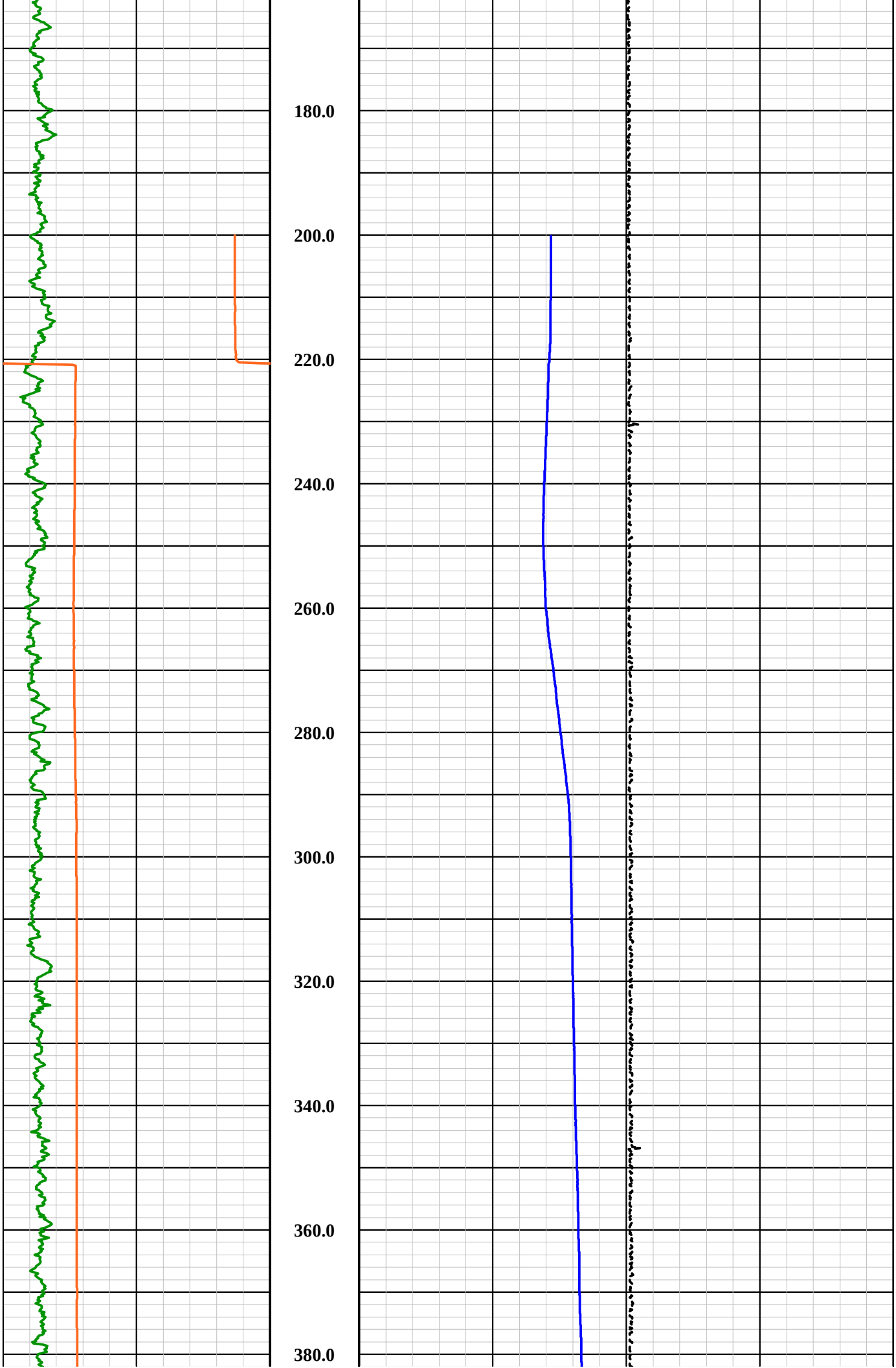
Caliper Arms Used: 9 IN. **Calibration Points:** 4 IN. & 12 IN.

E-Log Calibration Range: N/A **Calibration Points:** N/A

Disclaimer:

All interpretations of log data are opinions based on inferences from electrical or other measurements. We do not guarantee the accuracy or correctness of any interpretations or recommendations and shall not be liable or responsible for any loss, costs, damages, or expenses incurred or sustained by anyone resulting from any interpretation made by any of our employees or agents. These interpretations are also subject to our general terms and conditions set out in our current Service Invoice.

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300.0
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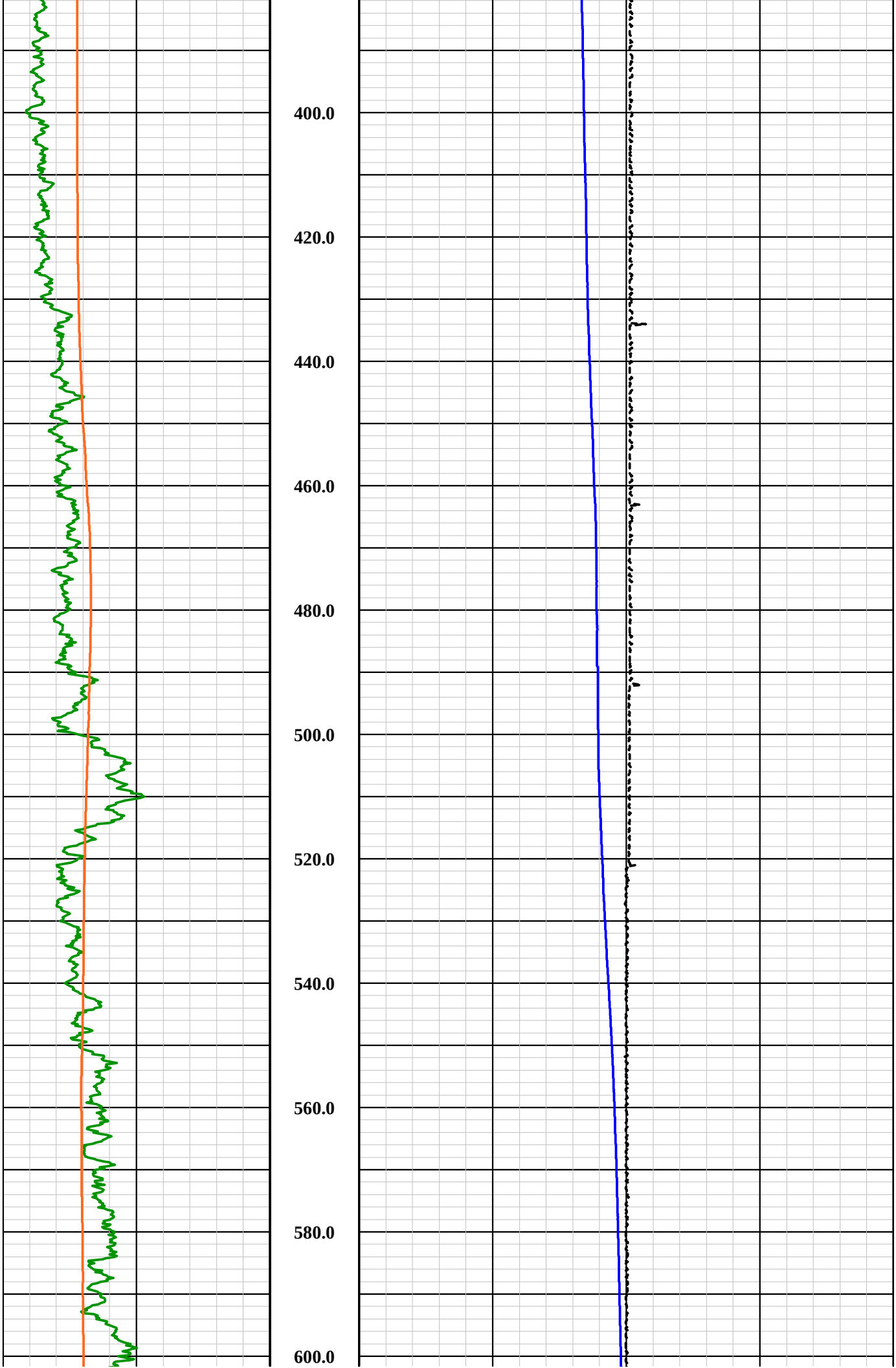
360.0
380.0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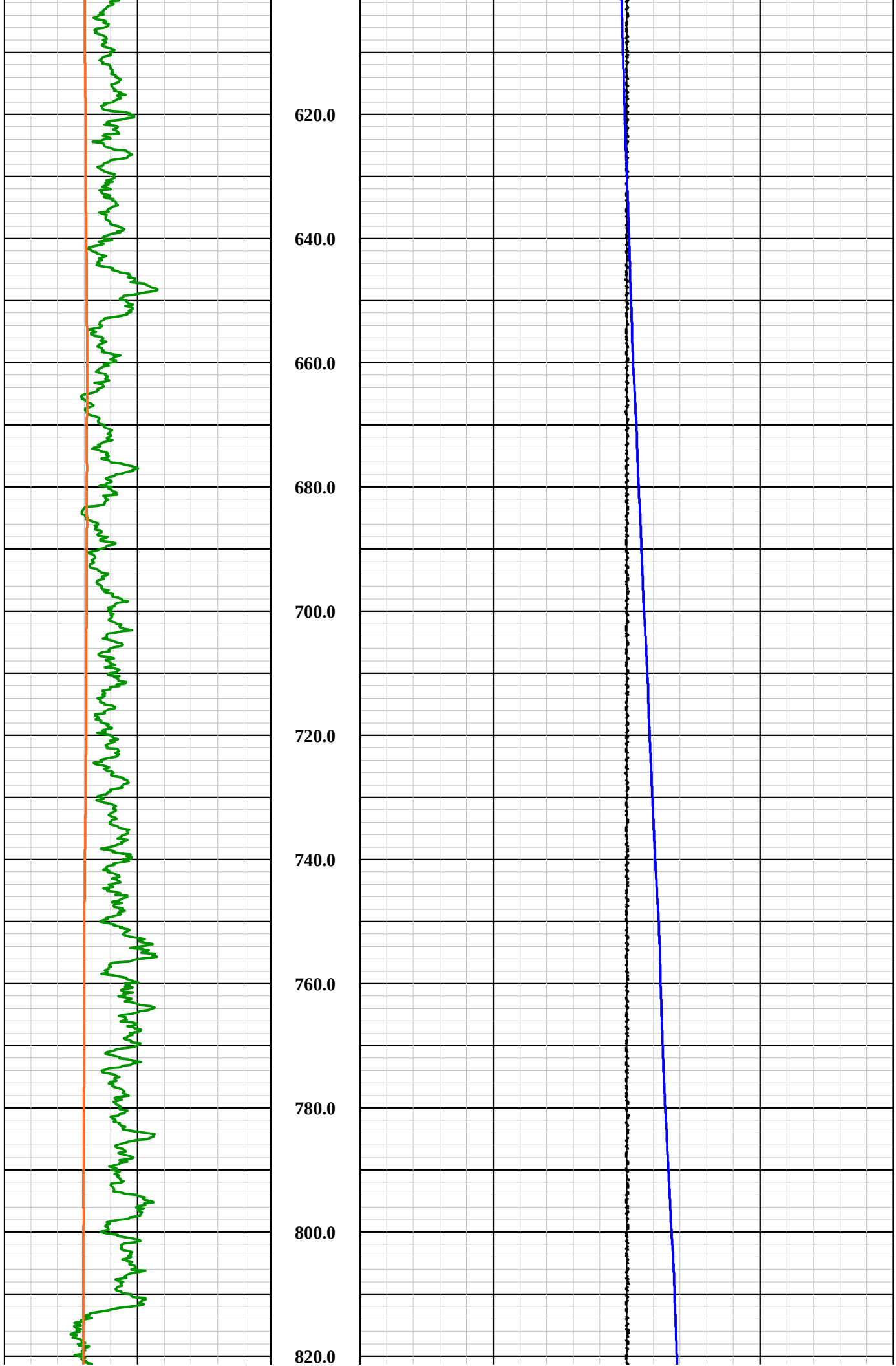
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720.0
740.0
760.0
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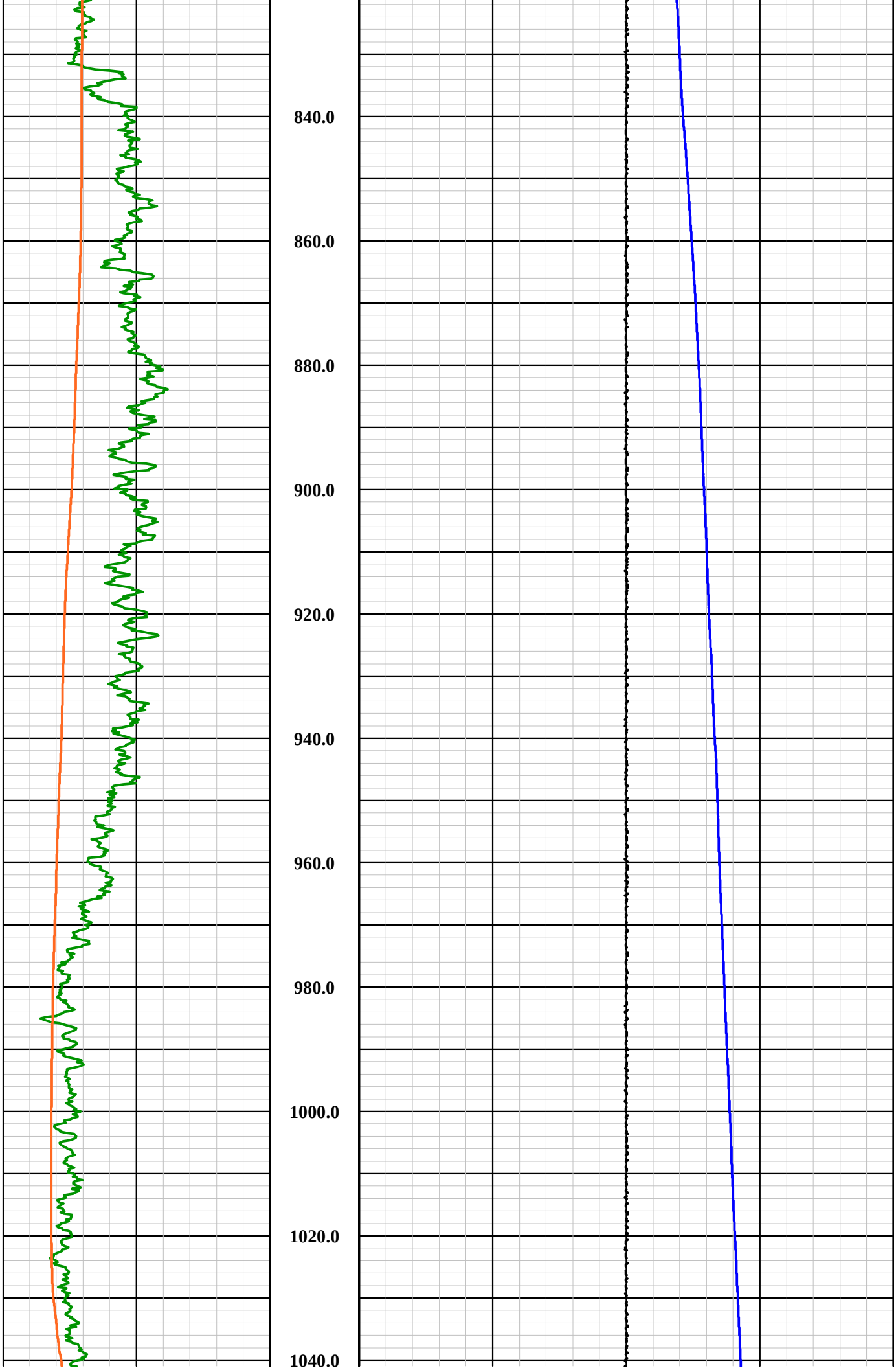
820.0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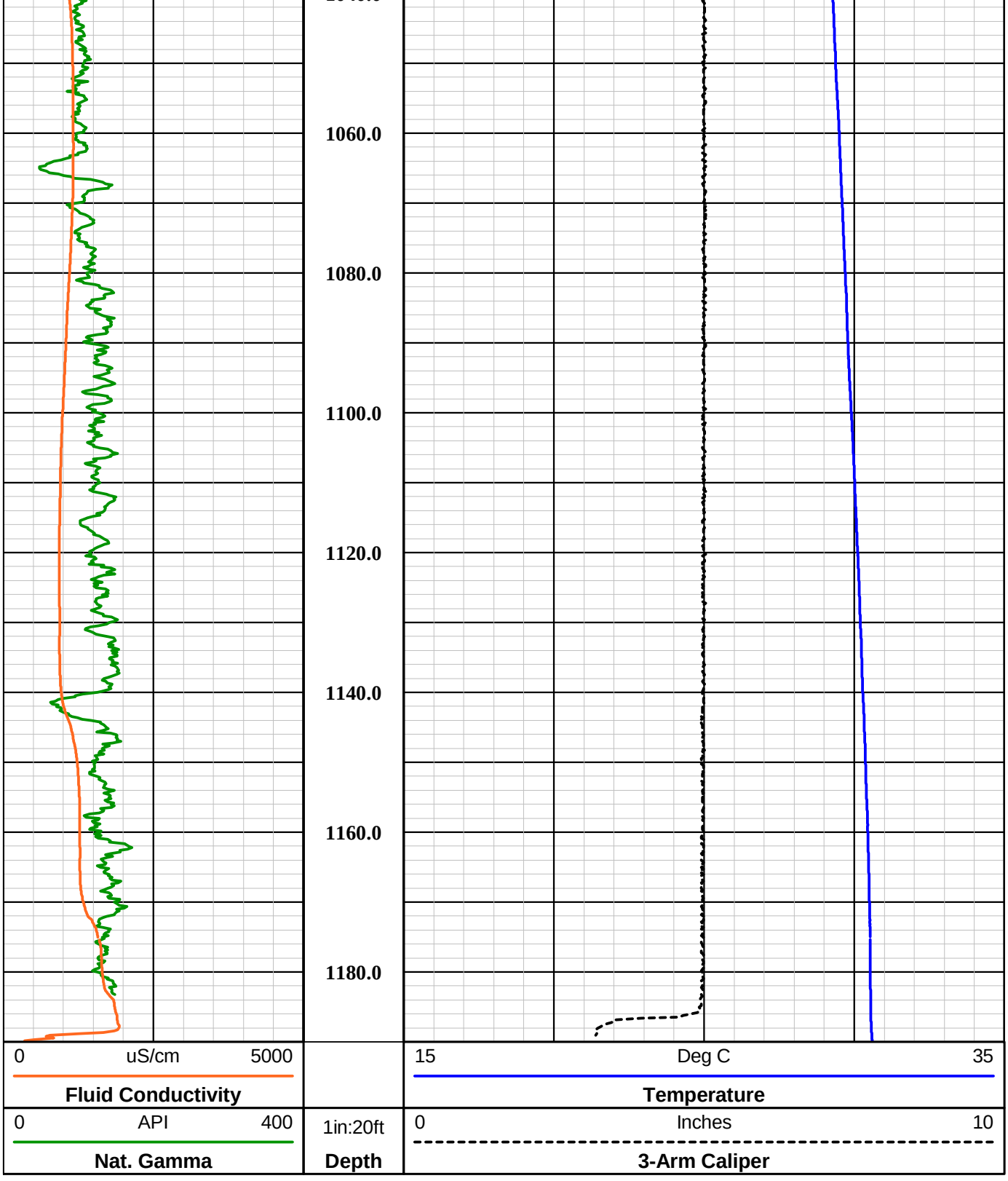
1020.0
1040.0



QL40 Gamma-Caliper-Temperature-Fluid Conductivity

Probe Top = Depth Ref.

Tool SN: 5613, 5979, 6161 & 6292

Four Conductor MSI Probe Top

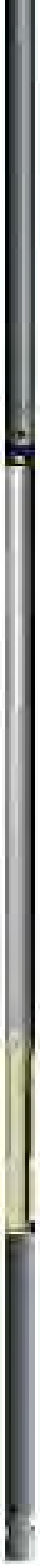
Probe Length = 3.69 m or 12.12 ft
Probe Weight = 18.195 kg or 40.11 lbs

Caliper arms can only collect data logging up hole

Caliper arms can only collect data logging up hole

Fluid Temperature/Conductivity and Natural Gamma can be collected logging up and down hole

Temperature Rating: 80 Deg C (176 Deg F)
Presure Rating: 200 bar (2900 psi)



Natural Gamma Ray = 1.07 m (42.12 in)

3-Arm Caliper = 1.78 m (70.27 in)

Available Arm Sizes: 3", 9", and 15"

FTC (Fluid Temperature/Conductivity) = 0.78 m (30.71 in)

1.57" or 40.0 mm Diameter

Southwest Exploration Services, LLC
borehole geophysics & video services

Company	FLORENCE COPPER
Well	R-05
Field	FLORENCE COPPER
County	PINAL
State	ARIZONA

Final GCFTC Summary

APPENDIX F

Cement Bond Log Summary

WELL R-05

Geophysical Log Summary

COMPANY:	FLORENCE COPPER COMPANY	Logging Engineer:	VARIOUS
FIELD:	FLORENCE COPPER SITE	Date Logged:	VARIOUS
WELL ID:	R-05	Processed By:	K.M / B.C.
COUNTY:	PINAL STATE: ARIZONA	Date Processed:	07-13-18

Southwest Exploration Services, LLC
borehole geophysics & video services

HALEY ALDRICH

R-05 Sonic CBL with Density Summary

Depth
1in:20ft

Nat. Gamma — Cased 3-2-18 — 0 API 400

3-Arm Caliper — Cased 3-2-18 — 0 Inches 10

Comp Density — Cased 3-2-18 — -1 g/cc 3

Compensation — Cased 3-2-18 — -3 g/cc 1

RX1 - VDL (60mm) - Btm — Open 2-2-18 — 100 uSec 1000

RX1- TT (60mm) - Btm — Open 2-2-18 — 100 uSec 1000

RX1 - VDL (60mm) - Top — Cased 12-7-17 — 100 uSec 1000

RX1 - TT (60mm) - Top — Cased 12-07-17 — 100 uSec 1000

Bond Index — 0 % 100

RX1 - VDL — Cased 3-2-18 — 100 uSec 1020

RX1 - TT — Cased 3-2-18 — 100 1020

RX4 - VDL — Cased 3-2-18 — 100 uSec 1020

RX4 - TT — Cased 3-2-18 — 100 1020

Velocity Analysis — Cased 3-2-18 — 40 us/ft 220

P-Wave Slow — Cased 3-2-18 — 40 us/ft 220

Steel — 40 us/ft 220

FRP — 40 us/ft 220

PVC — 40 us/ft 220

Cement

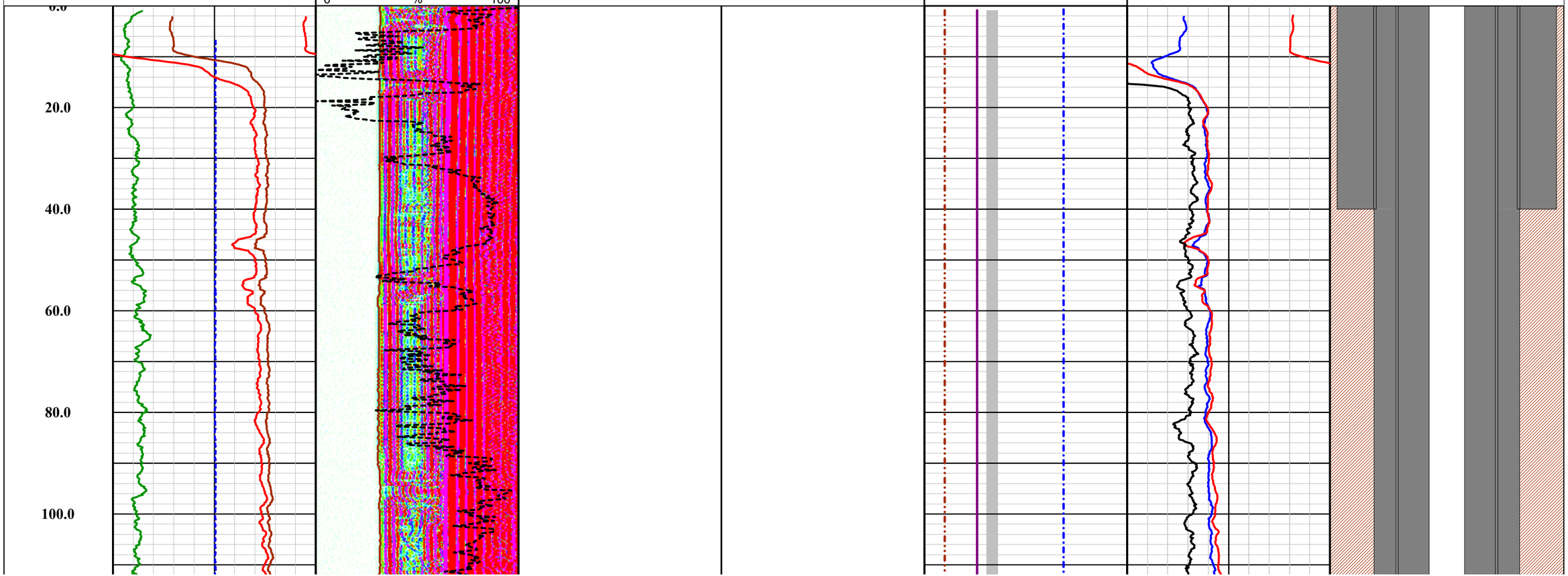
Near Density — Cased 3-2-18 — 1 g/cc 3

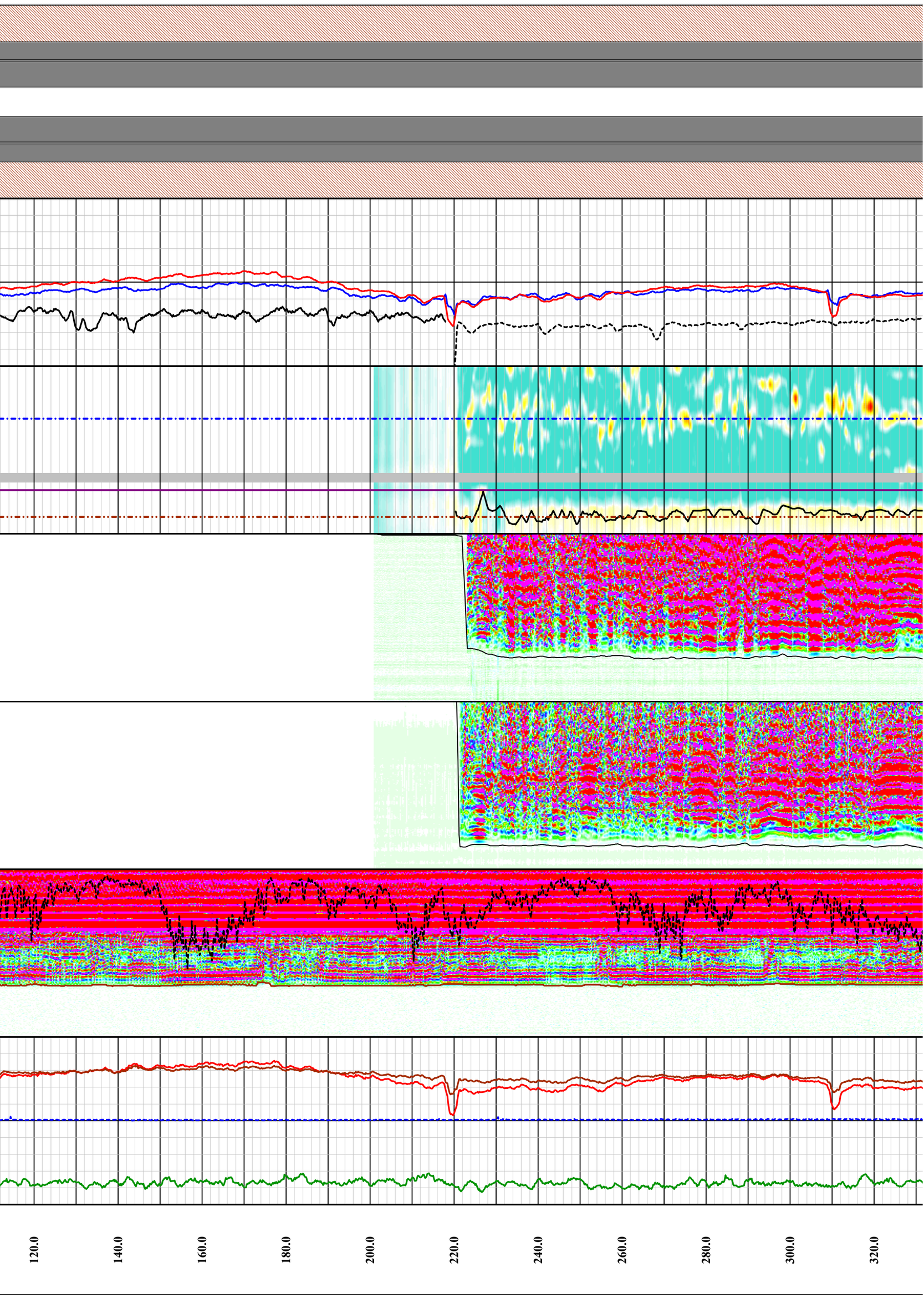
Far Density — Cased 3-2-18 — 1 g/cc 3

4 Pi Density (Dry) — Cased 3-2-18 — 1200 CPS 900

4 Pi Density (Wet) — Cased 3-2-18 — 300 CPS 0

Well Diagram

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300.0
320.0

340.0

360.0

380.0

400.0

420.0

440.0

460.0

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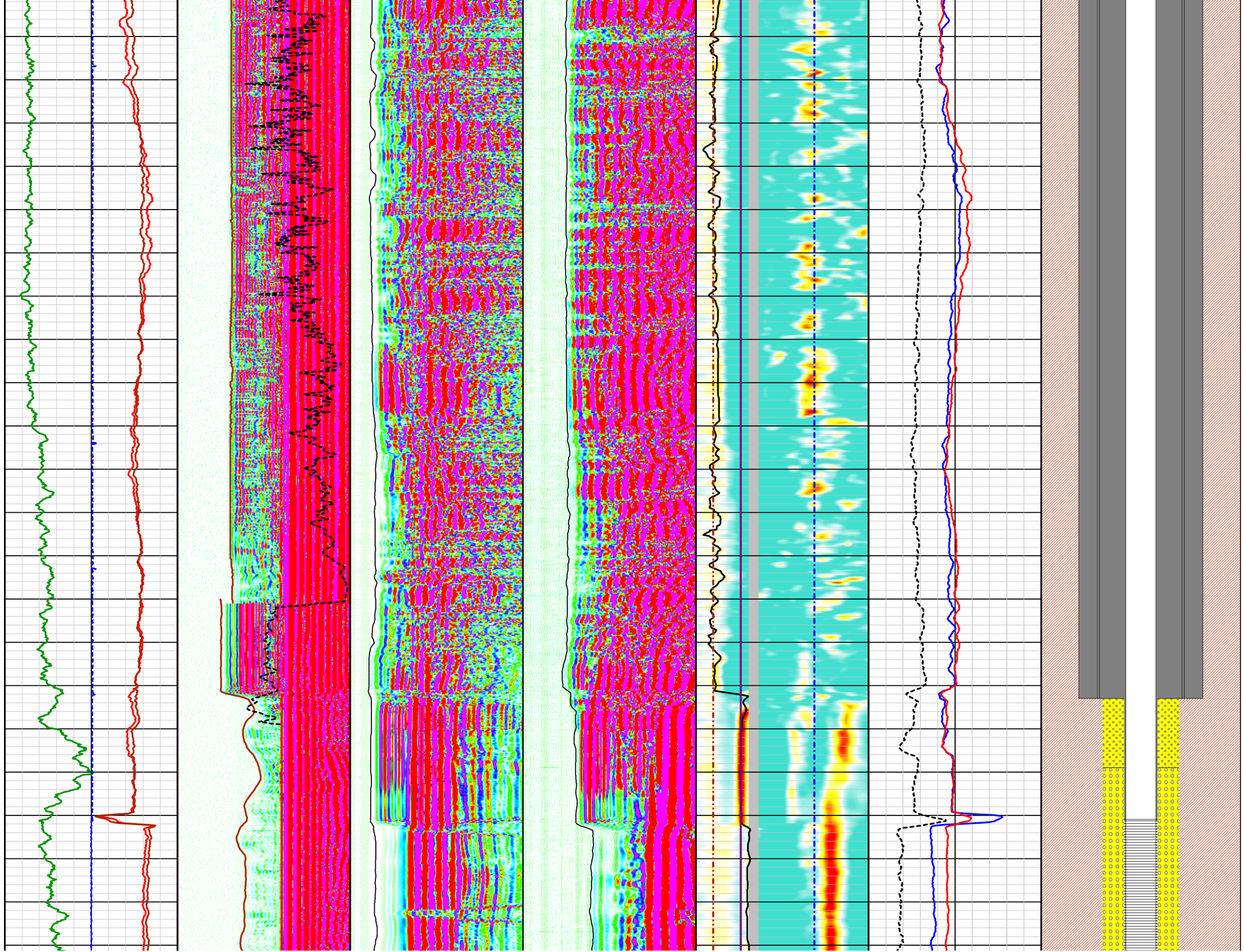
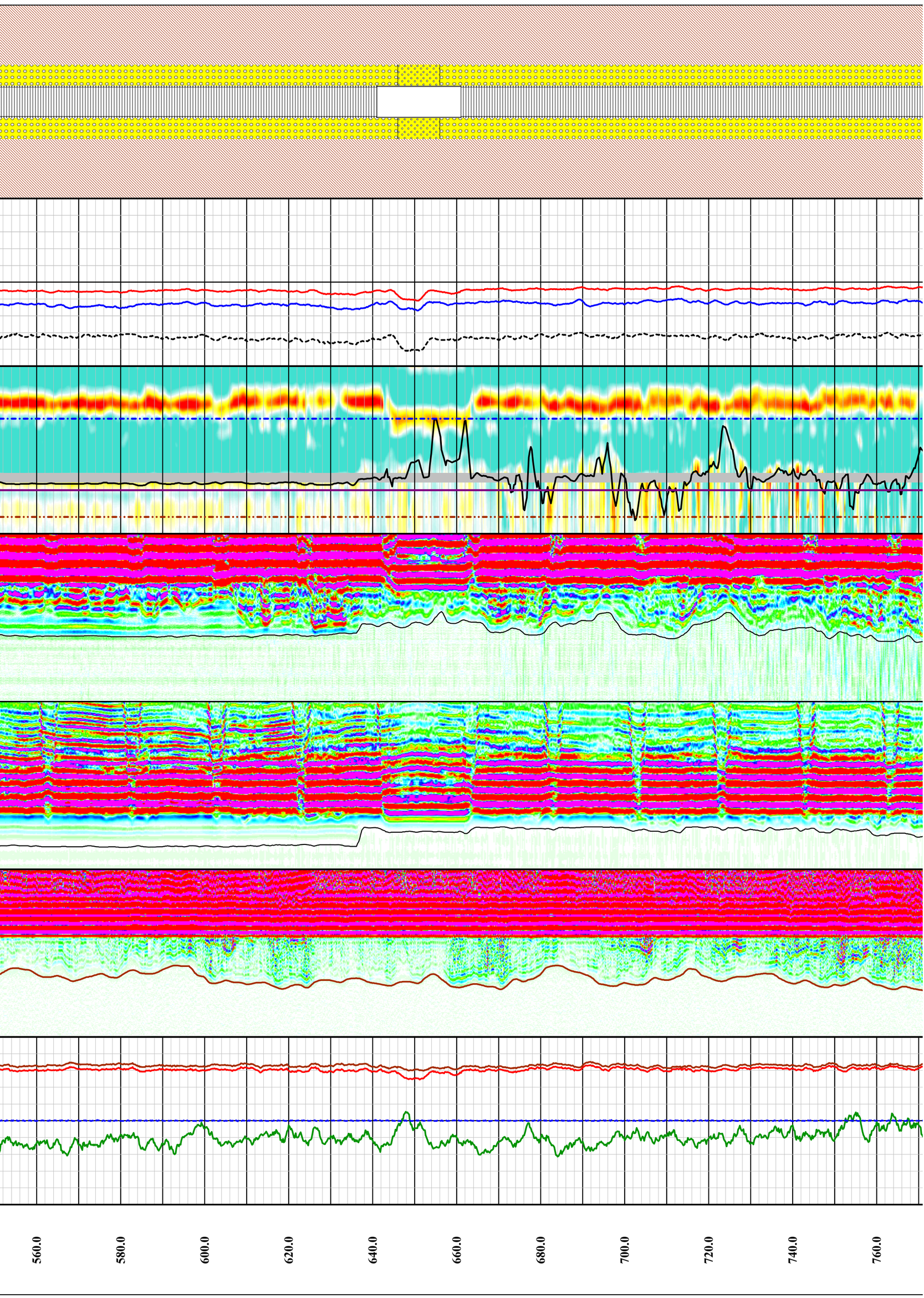
500.0

520.0

540.0

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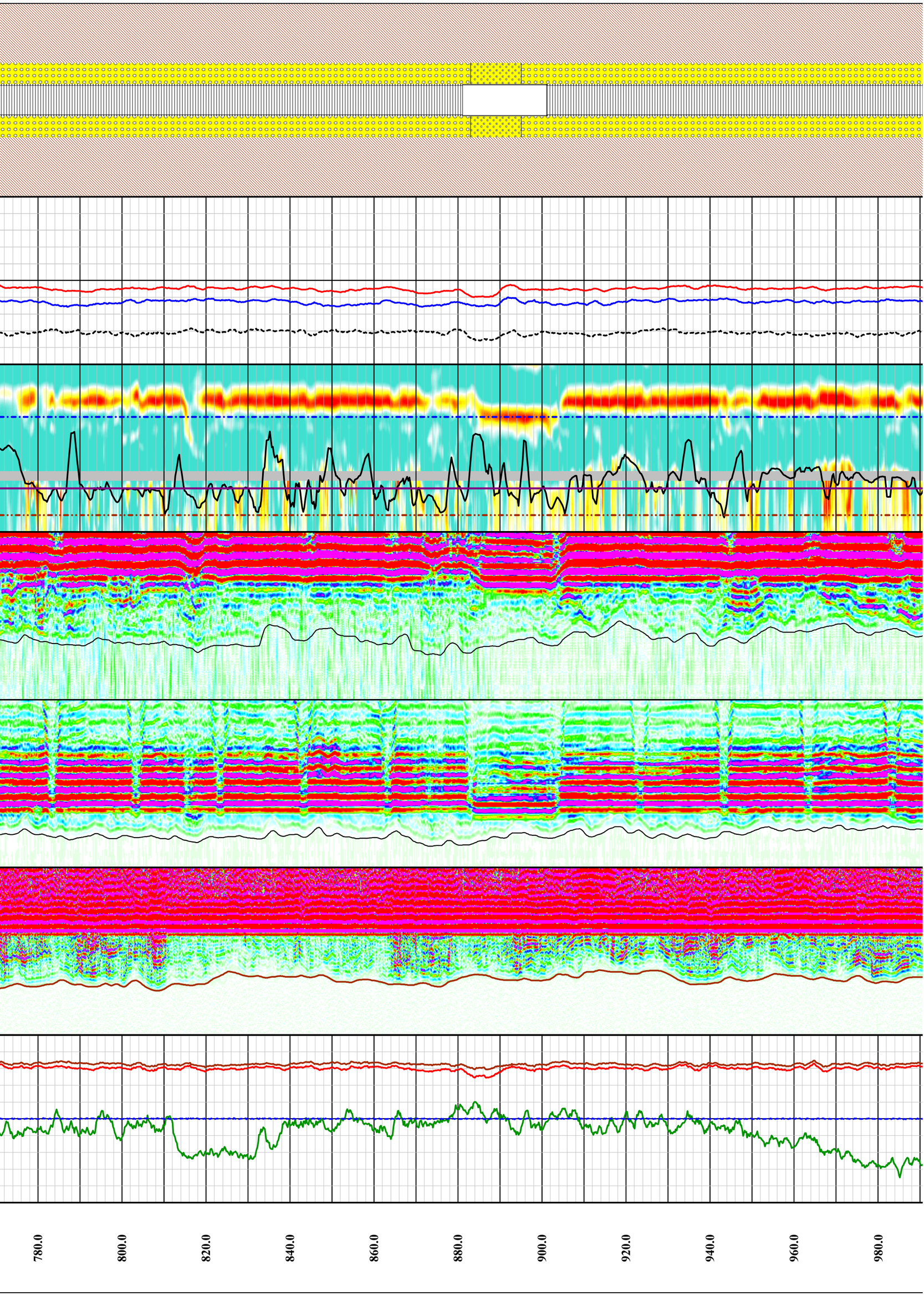
740.0
760.0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840.0
860.0
880.0
900.0
920.0
940.0
960.0
980.0

1000.0

1020.0

1040.0

1060.0

1080.0

1100.0

1120.0

1140.0

1160.0

1180.0

-3 g/cc 1

Cased 3-2-18

0 % 100

Bond Index

100 uSec 1000

Cased 12-07-17

Cement

40 us/ft 220

PVC

300 CPS 0

Cased 3-2-18

	-1 g/cc 3 Cased 3-2-18 **Compensation**	100 uSec 1000 Cased 12-7-17 **RX1 - TT (60mm) - Top**			40 us/ft 220 **FRP**	1200 CPS 900 Cased 3-2-18 **4 Pi Density (Wet)**	
	-1 g/cc 3 Cased 3-2-18 **Comp Density**	100 uSec 1000 Cased 12-7-17 **RX1 - VDL (60mm) - Top**			40 us/ft 220 **Steel**	1200 CPS 900 Cased 3-2-18 **4 Pi Density (Dry)**	
	0 Inches 10 Cased 3-2-18 **3-Arm Caliper**	100 uSec 1000 Open 2-2-18 **RX1- TT (60mm) - Btm**	100 1020 Cased 3-2-18 **RX1 - TT**	100 1020 Cased 3-2-18 **RX4 - TT**	40 us/ft 220 Cased 3-2-18 **P-Wave Slow**	1 g/cc 3 Cased 3-2-18 **Far Density**	
	0 API 400 Cased 3-2-18 **Nat. Gamma**	100 uSec 1000 Open 2-2-18 **RX1 - VDL (60mm) - Btm**	100 uSec 1020 Cased 3-2-18 **RX1 - VDL**	100 uSec 1020 Cased 3-2-18 **RX4 - VDL**	40 us/ft 220 Cased 3-2-18 **Velocity Analysis**	1 g/cc 3 Cased 3-2-18 **Near Density**	**Well Diagram**
1in:20ft **Depth**	**R-05 Sonic CBL with Density Summary**						

APPENDIX G

SAPT Documentation

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
STANDARD ANNULAR PRESSURE TEST

Operator FLORENCE COPPER, INC
Address 1575 W. HUNT HWY
FLORENCE, AZ 85132
Well Name R-05

State Permit No. P-101704
USEPA Permit No. R9UIC-AZ3-FY11-1
Date of Test 2/28/2018
Well Type ENV - RECOVERY - Class III

LOCATION INFORMATION SW Quarter of the NE Quarter of the SW Quarter of Section 28; Range 9E; Township 4S; County PINAL;

Company Representative IAN REAM; Field Inspector LAUREN CANDREVA;

Type of Pressure Gauge Pressure transducer with data logger inch face; 300 psi full scale; 0.001 psi increments;

New Gauge? Yes ☑ No ☐ If no, date of calibration ____ Calibration certification submitted? Yes ☐ No ☑

TEST RESULTS	
Readings must be taken at least every 10 minutes for a minimum of 30 minutes for Class II, III and V wells and 60 minutes for Class I wells. For Class II wells, annulus pressue should be at least 300 psig. For Class I wells, annulus pressure should be the greater of 300 psig or 100 psi above maximum permitted injection pressure. Original chart recordings must be submitted with this form.	5-year or annual test on time? Yes ☐ No ☑ 2-year test for TA'd wells on time? Yes ☐ No ☑ After rework? Yes ☐ No ☑ Newly permitted well? Yes ☑ No ☐

.

Pressure (in psig)

Time	Annulus	Tubing
14:15	143.07	same
14:25	143.26	same
14:35	143.65	same
14:45	144.03	same

Casing size 5" - NOMINAL
Tubing size 2"
Packer type INFLATABLE PACKER
Packer set @ 3.06(top), 505.05(bottom)
Top of Permitted Injection Zone 420 feet
Is packer 100 ft or less above top of Injection Zone ? Yes ☑ No ☐
If not, please submit a justification.
Fluid return (gal.) 0.37

Comments: Test conducted 3 times to confirm results - data for all tests included in attached table and chart

Test Pressures: Max. Allowable Pressure Change: Initial test pressure x 0.05 7.15 psi
Test Period Pressure change 0.96 psi

Test Passed ☑ Test Failed ☐

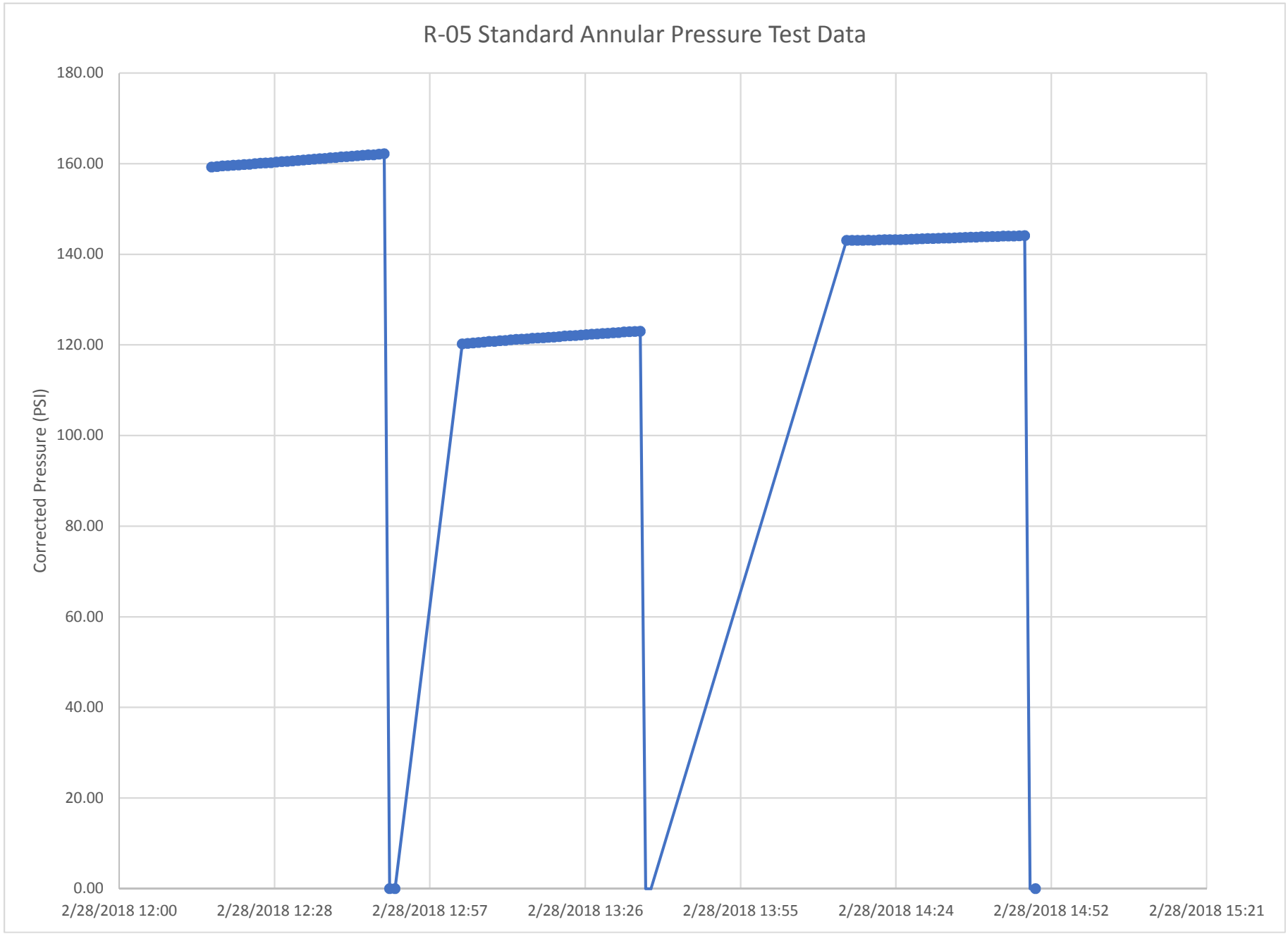
If failed test, well must be shut in, no injection can occur, and USEPA must be contacted within 24 hours. Corrective action needs to occur, the well retested, and written authorization received before injection can recommence.

I certify under penalty of law that this document and all attachments are, to the best of my knowledge and belief, true, accurate, and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment for knowing violations. (See 40 CFR 144.32(d))

Ian Ream
Printed Name of Company Representative

Signature of Company Representative

9-14-2018
Date


R-05 Standard Annular Pressure Test Data
Corrected Pressure (PSI)
180.00
160.00
140.00
120.00
100.00
80.00
60.00
40.00
20.00
0.00
2/28/2018 12:00
2/28/2018 12:28
2/28/2018 12:57
2/28/2018 13:26
2/28/2018 13:55
2/28/2018 14:24
2/28/2018 14:52
2/28/2018 15:21

Well R-05 SAPT Data		
Tranducer Serial Number:	554227	
Tranducer Model:	Level TROLL 400 non-vented 300 psi	
Date and Time	Pressure (PSI)	Corrected Presssure (PSI) (Sensor pressure - barometric pressure)
2/28/2018 12:17	173.35	159.27
2/28/2018 12:18	173.434	159.35
2/28/2018 12:19	173.55	159.47
2/28/2018 12:20	173.622	159.54
2/28/2018 12:21	173.73	159.65
2/28/2018 12:22	173.765	159.69
2/28/2018 12:23	173.885	159.81
2/28/2018 12:24	173.936	159.86
2/28/2018 12:25	174.058	159.98
2/28/2018 12:26	174.191	160.11
2/28/2018 12:27	174.204	160.12
2/28/2018 12:28	174.283	160.20
2/28/2018 12:29	174.415	160.34
2/28/2018 12:30	174.521	160.44
2/28/2018 12:31	174.563	160.48
2/28/2018 12:32	174.679	160.60
2/28/2018 12:33	174.746	160.67
2/28/2018 12:34	174.879	160.80
2/28/2018 12:35	174.961	160.88
2/28/2018 12:36	175.063	160.98
2/28/2018 12:37	175.167	161.09
2/28/2018 12:38	175.222	161.14
2/28/2018 12:39	175.358	161.28
2/28/2018 12:40	175.434	161.35
2/28/2018 12:41	175.548	161.47
2/28/2018 12:42	175.631	161.55
2/28/2018 12:43	175.728	161.65
2/28/2018 12:44	175.803	161.72
2/28/2018 12:45	175.905	161.83
2/28/2018 12:46	176.008	161.93
2/28/2018 12:47	176.029	161.95
2/28/2018 12:48	176.172	162.09
2/28/2018 12:49	176.242	162.16
2/28/2018 12:50	14.08	0.00
2/28/2018 12:51	14.095	0.02
2/28/2018 13:03	134.314	120.23
2/28/2018 13:04	134.401	120.32
2/28/2018 13:05	134.517	120.44
2/28/2018 13:06	134.6	120.52
2/28/2018 13:07	134.714	120.63
2/28/2018 13:08	134.828	120.75

Well R-05 SAPT Data		
Tranducer Serial Number:	554227	
Tranducer Model:	Level TROLL 400 non-vented 300 psi	
Date and Time	Pressure (PSI)	Corrected Presssure (PSI) (Sensor pressure - barometric pressure)
2/28/2018 13:09	134.844	120.76
2/28/2018 13:10	134.976	120.90
2/28/2018 13:11	135.05	120.97
2/28/2018 13:12	135.188	121.11
2/28/2018 13:13	135.27	121.19
2/28/2018 13:14	135.357	121.28
2/28/2018 13:15	135.369	121.29
2/28/2018 13:16	135.559	121.48
2/28/2018 13:17	135.593	121.51
2/28/2018 13:18	135.632	121.55
2/28/2018 13:19	135.741	121.66
2/28/2018 13:20	135.805	121.73
2/28/2018 13:21	135.911	121.83
2/28/2018 13:22	136.05	121.97
2/28/2018 13:23	136.099	122.02
2/28/2018 13:24	136.152	122.07
2/28/2018 13:25	136.256	122.18
2/28/2018 13:26	136.323	122.24
2/28/2018 13:27	136.45	122.37
2/28/2018 13:28	136.493	122.41
2/28/2018 13:29	136.567	122.49
2/28/2018 13:30	136.618	122.54
2/28/2018 13:31	136.742	122.66
2/28/2018 13:32	136.789	122.71
2/28/2018 13:33	136.912	122.83
2/28/2018 13:34	136.99	122.91
2/28/2018 13:35	137.037	122.96
2/28/2018 13:36	137.096	123.02
2/28/2018 13:37	14.078	0.00
2/28/2018 13:38	14.041	-0.04
2/28/2018 14:14	157.15	143.07
2/28/2018 14:15	157.153	143.07
2/28/2018 14:16	157.127	143.05
2/28/2018 14:17	157.143	143.06
2/28/2018 14:18	157.199	143.12
2/28/2018 14:19	157.171	143.09
2/28/2018 14:20	157.251	143.17
2/28/2018 14:21	157.273	143.19
2/28/2018 14:22	157.305	143.23
2/28/2018 14:23	157.301	143.22
2/28/2018 14:24	157.31	143.23

Well R-05 SAPT Data		
Tranducer Serial Number:	554227	
Tranducer Model:	Level TROLL 400 non-vented 300 psi	
Date and Time	Pressure (PSI)	Corrected Presssure (PSI) (Sensor pressure - barometric pressure)
2/28/2018 14:25	157.343	143.26
2/28/2018 14:26	157.382	143.30
2/28/2018 14:27	157.437	143.36
2/28/2018 14:28	157.474	143.39
2/28/2018 14:29	157.528	143.45
2/28/2018 14:30	157.569	143.49
2/28/2018 14:31	157.6	143.52
2/28/2018 14:32	157.641	143.56
2/28/2018 14:33	157.668	143.59
2/28/2018 14:34	157.716	143.64
2/28/2018 14:35	157.734	143.65
2/28/2018 14:36	157.796	143.72
2/28/2018 14:37	157.833	143.75
2/28/2018 14:38	157.849	143.77
2/28/2018 14:39	157.936	143.86
2/28/2018 14:40	157.949	143.87
2/28/2018 14:41	157.982	143.90
2/28/2018 14:42	158.009	143.93
2/28/2018 14:43	158.073	143.99
2/28/2018 14:44	158.074	143.99
2/28/2018 14:45	158.107	144.03
2/28/2018 14:46	158.139	144.06
2/28/2018 14:47	158.2	144.12
2/28/2018 14:48	14.069	-0.01
2/28/2018 14:49	14.086	0.01

APPENDIX H

Well Development Field Forms

DEVELOPMENT
FIELD DATA LOG

Project Name: Florence Copper	Project No.: 129687-007
Well No.: P-05	Date: 13 February 2018 - 14 February 2018
Location: See Plan	Measuring Point: TOC
Total Depth of Well (ft bls):	Screen Interval (ft bls):
Pump Type/Setting (ft bls): Varies	Activity: Air lifting
How Q Measured: -	H&A Personnel: R. Bansal

Time	Discharge (gpm)	Pumping Water Level (ft)	Specific Capacity (gpm/ft)	Sand Content (ppm)	pH	Sp. Cond. (µmhos/cm)	Temp. °C	Turbidity NTU	Comments
2/13/18 1220	Eductor @ 390 ft		Airline @ 394 ft			Pressure @ 140 psi			start airlifting
	Not possible to sample, running dry, minimal water return								
1251	-	-	-	-	-	-	-	-	stop airlifting
1414	Eductor @ 616 ft		Airline @ 420 ft			Pressure @ 170 psi			start airlifting
1415	-	-	-	0.1	7.93	2002	23.33	OR	muddy brown, slimy
1430	-	-	-	0.1	7.69	1886	23.23	OR	muddy brown, slimy
1445	-	-	-	Ø	7.91	1941	22.62	OR	muddy brown, slimy
1500	-	-	-	Ø	8.03	1854	23.14	OR	muddy brown, slimy
1530	-	-	-	Ø	8.11	1883	23.88	OR	muddy brown, slimy
1600	-	-	-	Ø	8.19	1878	23.39	OR	muddy brown, slimy
1630	-	-	-	Ø	8.18	1817	23.54	OR	muddy brown / slimy
1700	-	-	-	Ø	8.24	1828	20.61	OR	muddy brown, slimy
1730	-	-	-	Ø	8.22	1813	21.91	OR	muddy brown, slimy
1745	-	-	-	Ø	8.23	1844	22.56	OR	muddy brown, slimy
1747	-	-	-	-	-	-	-	-	stop airlifting
2/14/18 0714	-	-	-	-	-	-	-	-	start airlifting @ 170 psi
0730	-	-	-	Ø	8.51	1737	18.50	OR	muddy brown, not slimy
0745	-	-	-	Ø	8.62	1633	16.34	OR	muddy brown, light
0800	-	-	-	Ø	8.34	1431	11.85	OR	running dry
0805	-	-	-	-	-	-	-	-	stop airlifting
1020	Eductor @ 616 ft		Airline @ 564 ft			Pressure @ 210 psi			start airlifting
1030	-	-	-	Ø	8.02	1683	19.55	OR	cloudy, muddy brown
1045	-	-	-	Ø	8.07	1681	19.03	OR	muddy brown, slimy
1130	-	-	-	Ø	7.95	1601	21.23	OR	muddy brown, slimy
1215	-	-	-	Ø	7.49	1547	20.93	606	lighter brown
1230	-	-	-	Ø	8.01	1512	21.40	526	lighter brown
1245	-	-	-	Ø	8.02	1527	21.62	463	lighter brown
1352	-	-	-	-	-	-	-	-	stop airlifting

Comments:

HALEY ALDRICH

DEVELOPMENT
FIELD DATA LOG

Project Name: Florence Copper	Project No.: 129867-007
Well No.: P-05	Date: 4/14/18 - 4/15/18
Location: SOO PIAN	Measuring Point: TOC
Total Depth of Well (ft bls):	Screen Interval (ft bls):
Pump Type/Setting (ft bls): Varies	Activity: Air Lifting
How Q Measured: -	H&A Personnel: R. Barsal

Time	Discharge (gpm)	Pumping Water Level (ft)	Specific Capacity (gpm/ft)	Sand Content (ppm)	pH	Sp. Cond. (µmhos/cm)	Temp. °C	Turbidity NTU	Comments
1450	Eductor @ 1004 ft	Airline	@ 598 ft	pressure @ 210 psi					start air lifting
1500	-	-	-	0	6.87	1370	13.16	OR	muddy brown
1515	-	-	-	0	7.85	1480	21.17	413	lighter brown
1600	-	-	-	0	7.57	1435	20.73	293	lighter brown
1615	-	-	-	0	8.01	1440	21.44	254	clearer, not slimy
1622	-	-	-	-	-	-	-	-	stop air lifting
4/15/18 0730	-	-	-	-	~~7.11~~	~~1342~~	~~17.61~~	~~435~~	E: 1145 ft A: 576 ft P: 300 psi
0739	-	-	-	0.2	7.11	1342	17.61	435	light brown, no solids
0845	-	-	-	0.2	7.87	1582	19.47	OR	light brown
0910	-	-	-	17.5	7.95	1603	22.42	OR	muddy brown @ 1158 ft
1000	-	-	-	14	8.01	1456	22.38	OR	muddy brown, sediment
1030	-	-	-	26	8.06	1482	23.20	OR	muddy brown, sediment @ 1158 ft
1100	-	-	-	11	8.05	1474	23.41	OR	gravel present in core & mud
1130	-	-	-	3	8.09	1457	23.45	OR	fine sands @ 1164 ft
1200	-	-	-	0.5	8.02	1447	23.65	233	clear, light brown, mud
1250	-	-	-	-	-	-	-	-	stop air lifting to lower airline
1320	-	-	-	-	-	-	-	-	start air lifting
1330	-	-	-	1.0	8.07	1416	22.55	OR	light brown, mud
1400	-	-	-	2	8.09	1445	23.45	OR	light brown
1430	-	-	-	5	8.08	1439	23.66	159	Gravel
1500	-	-	-	1	8.09	1440	23.94	624	clear fine sands, gravel
1530	-	-	-	0.5	8.10	1434	23.80	139	clear
1600	-	-	-	2	8.09	1430	23.56	417	gravel & sands @ 1185 ft
1630	-	-	-	55	8.06	1494	23.63	OR	muddy brown sediment @ 1190 ft
1700	-	-	-	3	8.05	1413	22.86	211	clear, little sediment @ 1175 ft
1730	-	-	-	4	8.30	1380	21.78	331	clear, some gravel @ 1199 ft
1745	-	-	-	22	8.13	1408	23.23	OR	muddy brown
1900	-	-	-		8.21	1403	23.46	479	clearer brown

Comments:

HALEY ALDRICH

DEVELOPMENT
FIELD DATA LOG

Project Name: Florence Copper	Project No.: 129867-007
Well No.: P-05	Date: 2/15/18 - 2/17/18
Location: See Plan	Measuring Point: TOC
Total Depth of Well (ft bls):	Screen Interval (ft bls):
Pump Type/Setting (ft bls): Varies	Activity: Air Lifting
How Q Measured: -	H&A Personnel: RBansal

Time	Discharge (gpm)	~~Pumping Water Level~~ (ft)	~~Specific Capacity~~ (gpm/ft)	Sand Content (ppm)	pH	Sp. Cond. (µmhos/cm)	Temp. °C	Turbidity NTU	Comments
2/15/18									
1015	-	-	-	0.3	8.16	1399	23.23	357	clearer
1030	-	-	-	-	-	-	-	-	stop airlifting
2/16/18									
0750	-	-	-	-	-	-	-	-	start airlifting @ 1194ft
0785	-	-	-	1.5	7.70	1323	20.24	236	clear, gravel+sediment
0910	-	-	-	0.3	7.92	13800	22.60	289	clear, fewer particulates
0930	-	-	-		8.00	1427	22.99	125	clear, fewer particulates
0934	-	-	-	-	-	-	-	-	stopped airlifting, injecting
2/17/18									
0922	Eductor @ 390ft	Airline @ 294ft				Pressure @ 150psi			start airlifting
0925	-	-	-	2/150	10.35	134467	14.10	OR	muddy brown
0940	-	-	-	-	-	-	-	-	stop airlifting
0945	-	-	-	-	-	-	-	-	start airlifting
0945	-	0.00	0.00	>1250	11.26	144942	20.65	OR	muddy brown, visible sediment not settling
0900	-	0.00	0.00	9	8.40	101572	18.10	OR	slimy, cloudy, boring
0915	-	-	-	0.7	7.92	70455	21.72	OR	slimy, cloudy, dirty
0945	-	0.00	0.00	0.3	8.54	40451	22.36	OR	slimy, muddy brown
1015	-	-	-	0.1	8.29	15630	22.46	OR	slimy, muddy brown
1045	-	0.30	>4.40	Ø	8.16	4026	22.71	955	slimy, brown
1100	-	-	-	Ø	8.19	2631	22.90	488	clearer, not slimy
1115	-	>4.40	>4.40	Ø	8.03	2288	23.41	376	clear, not slimy
1126	-	-	-	-	-	-	-	-	stop airlifting
1241	Eductor @ 616ft	Airline @ 420 ft				Pressure @ 200psi			start airlifting
1245	-	0.00	0.47	0.4	8.29	2483	22.51	663	brown, low sediment visible
1300	-	-	-	Ø	8.15	1511	23.04	108	clear
1315	-	0.01	0.17	Ø	8.09	1486	23.39	67.4	clear
1330	-	-	-	Ø	8.08	1446	23.19	57.7	clear
1345	-	0.00	0.01	Ø	8.07	1459	23.71	47.4	clear
1355	-	-	-	-	-	-	-	-	stop airlifting
1509	Eductor @ 810ft	Airline @ ~~671~~ 576 ft				Pressure @ 300psi			start airlifting

Comments:

DEVELOPMENT
FIELD DATA LOG

Project Name: Florence Copper	Project No.: 129867-007
Well No.: R-05	Date: 2/17/18
Location: see plan	Measuring Point: TOC
Total Depth of Well (ft bls):	Screen Interval (ft bls):
Pump Type/Setting (ft bls): Villes	Activity: Air lifting
How Q Measured:	H&A Personnel: R. Bansal

Time	Discharge (gpm)	~~Pumping Water Level (ft)~~ Free Cl	~~Specific Capacity (gpm/ft)~~ Total Cl	Sand Content (ppm)	pH	Sp. Cond. (µmhos/cm)	Temp. °C	Turbidity NTU	Comments
1515	—	0.00	0.00	0.2	8.00	1473	22.48	84.9	clear, low sediment
1530	—	—	—	0	7.96	1418	23.63	58.8	clear
1545	—	0.01	0.03	0	7.98	1426	23.28	42.8	clear
1600	—	—	—	0	8.01	1429	23.50	37.8	clear
1615	—	0.00	0.00	0	8.00	1424	23.56	37.7	clear
1618	—	—	—	—	—	—	—	—	stop airlifting
1739	Educto	@ 1004	Ft Airline	@ 576	Ft Pressure	@ 210	psi	start airlifting	
1745	—	0.00	0.00	0.6	7.79	1501	22.18	373	murky brown
1755	—	—	—	0	7.91	1333	23.16	—	clear
1800	—	—	—	—	—	—	—	—	stop airlifting
0710	—	—	—	—	—	—	—	—	start airlifting
0715	—	0.00	0.00	0	7.60	1300	19.66	577	clear/cloudy
0730	—	—	—	0	7.75	1392	21.65	68.5	clear
0745	—	0.00	0.00	0	8.04	1405	23.01	52.6	clear
0800	—	—	—	0	8.05	1402	22.87	42.2	clear
0815	—	0.00	0.00	0	8.00	1400	22.66	35.0	clear
0823	—	—	—	—	—	—	—	—	stop airlifting
0942	Educto	@ 1004	Ft Airline	@ 576	Ft Pressure	@ 240	psi	~~1446~~	~~22.70~~ ~~315~~ start airlifting
0945	—	0.00	0.00	0.5	8.10	1496	22.70	315	brown
1000	—	—	—	0	8.06	1449	23.92	111	clear
1015	—	0.06	0.00	0	8.07	1438	23.46	59.4	clear
1030	—	—	—	0.1	8.07	1431	23.68	48.3	clear, some gravel
1045	—	—	—	0.1	8.10	1431	23.75	38.5	clear, some gravel
1100	—	0.00	0.00	0	~~8.13~~	1425	23.63	34.2	clear
1103	—	—	—	—	—	—	—	—	stop airlifting

2/16/18

2/19/18

Comments:

HALEY ALDRICH

DEVELOPMENT
FIELD DATA LOG

Project Name: FCI	Project No.: 129687-007
Well No.: [redacted] R-05	Date: 2/22/18 - 02/23/18
Location: See plan	Measuring Point:
Total Depth of Well (ft bls):	Screen Interval (ft bls):
Pump Type/Setting (ft bls):	Activity: Pumping
How Q Measured:	H&A Personnel:

Time	Discharge (gpm)	Pumping Water Level (ft)	Specific Capacity (gpm/ft)	Sand Content (ppm)	pH	Sp. Cond. (µmhos/cm)	Temp. °C	Turbidity NTU	Comments
		Free Cl-	Total Cl-						
Totalizer	Initial = 345901	Gallons			Initial	water	level =	220.67	Pump @ 1164'
1300	63	0.05	0.00	0.4	7.66	2308	23.88	53.7	Clear
1315	63	0.01	0.00	<0.1	7.60	2431	24.46	48.1	Clear DTW = 261.86
1730	63	0.03	0.00	0.0	7.60	2380	23.63	23.7	Clear DTW = 262.35
1745	63	0.00	0.33	0.0	7.62	2385	24.25	19.1	Clear DTW = 266.25
1800	63	0.28	0.06	0.0	7.67	2349	23.48	17.3	Clear DTW = 263.96
02/23/18	Stopped pumping end of shift, will continue in morning								
0700	Forgot to record end totalizer reading yesterday								
	This morning it's at 349768, but there may								
	have been some backflow.								
Totalizer	Initial = 349768				DTW initial =			220.00	Pump still @ 1164'
0722	63	0.24	0.00	0.00	8.74	2260	20.34	57.4	Clear, yellow tint DTW = 259.73
0737	63	0.00	0.01	0.00	7.90	2518	23.91	27.6	Clear DTW = 260.29
0752	63	0.04	0.06	0.00	7.81	2509	23.84	17.3	Clear DTW = 261.28
0807	63	0.06	0.10	0.00	7.79	2479	23.83	15.0	Clear DTW = 262.01
0822	63	0.26	0.19	0.00	7.78	2510	24.01	14.3	Clear DTW = 262.77
0837	65	0.04	0.05	0.00	7.82	2448	23.40	12.8	Clear DTW = 262.95
0852	63	0.00	0.09	0.00	7.75	2437	23.28	13.6	Clear DTW = 263.30
0907	63	0.00	0.08	0.00	7.94	2401	22.45	12.4	Clear DTW = 263.83
0930	63	0.04	0.11	0.00	7.95	2502	24.55	12.7	Clear DTW = 263.67
0950	63	0.32	0.09	0.00	7.91	2487	24.57	12.5	Clear DTW = 264.57
1010	63	0.00	0.08	0.00	7.85	2491	24.52	11.5	Clear DTW = 264.86
1015	going to surge								
1031	63	0.06	0.05	0.0	7.95	2444	23.90	15.8	Clear DTW = 263.21
1050	63	0.03	0.00	0.0	7.80	2481	24.03	11.8	Clear DTW = 264.01
1105	63			0.0	7.79	2489	24.33	12.6	Clear DTW = 262.26
1107	Stopped to Surge								
1137	Totalizer 362443			DTW:	=> 225.00				

Comments:

HALEY ALDRICH

DEVELOPMENT
FIELD DATA LOG

Project Name: FCI	Project No.:
Well No.: R-05	Date: 02/23/18
Location:	Measuring Point:
Total Depth of Well (ft bls):	Screen Interval (ft bls):
Pump Type/Setting (ft bls):	Activity:
How Q Measured:	H&A Personnel: P. Clarizio

Time	Discharge (gpm)	Pumping Water Level (ft)	Specific Capacity (gpm/ft)	Sand Content (ppm)	pH	Sp. Cond. (µmhos/cm)	Temp. °C	Turbidity NTU	Comments
1130	63	—	—	0.0	7.92	2461	24.01	15.5	Clear DTW = 262.20
1145	63	263.33	—	0.0	7.79	2468	24.59	12.2	Clear
1200	63	263.86	—	0.0	7.77	2495	24.75	11.7	Clear
1215	63	264.09	—	0.0	7.69	2481	24.17	11.1	Clear
1230	63	264.72	—	0.0	7.82	2433	24.38	10.4	Clear
1245	63	264.96	—	0.0	7.84	2460	24.28	10.2	Clear
1300	63	265.01	—	0.0	7.83	2472	24.49	10.1	Clear
1302	Surge, pause in pumping								
1315	63	260.68	—	0.0	7.79	2472	24.54	10.9	Clear
1330	63	264.11	—	0.0	7.81	2446	24.56	10.6	Clear
1345	63	264.36	—	0.0	7.78	2438	2398	10.3	Clear
1400	63	264.65	—	0.0	7.76	2407	23.60	9.82	Clear
1415	63	265.99	—	0.0	7.76	2468	24.46	9.46	Clear
1416	Pause to surge						371	868	Totalizer DTW = 225.58
1440	Pump Started								
1440	63	260.44	—	0.0	7.86	2397	22.14	13.1	Clear
1455	63	263.29	—	0.0	7.77	2436	23.04	10.0	Clear
1488	Pause to surge			Totalizer	372825				
1512	DTW = 225.01			Pump	Start				
1513	63	261.47	—	0.0	7.83	2377	23.60	13.2	Clear
1528	63	263.01	—	0.0	7.81	2467	23.07	13.6	Clear
1530	Pump Stopped,								Pause to surge
1532	Totalizer	374110				230.45 = DTW			
1541	Pump Start								
1541	63	262.01	—	0.0	8.04	2296	20.35	4.81	Clear
1556	63	263.02	—	0.0	7.90	2408	22.76	9.94	Clear
1611	63	263.86	—	0.0	8.01	2381	21.92	9.92	Clear
1618		End totalizer		376344					pump stopped, tripping up to 902.63

Comments:

903.63

HALEY ALDRICH

DEVELOPMENT
FIELD DATA LOG

Project Name: FCI	Project No.: 129687-007
Well No.: R-05	Date: 2/24/18
Location:	Measuring Point: GROUND SURFACE
Total Depth of Well (ft bls): 1200	Screen Interval (ft bls):
Pump Type/Setting (ft bls): 900'	Activity: PUMP DEVELOPMENT
How Q Measured: FLOW METER	H&A Personnel: C. GUSTA

Time	Discharge (gpm)	Pumping Water Level (ft)	Specific Capacity (gpm/ft)	Sand Content (ppm)	pH	Sp. Cond. (µmhos/cm)	Temp. °C	Turbidity NTU	Comments
730	0	220.74		~~>1~~	8.09				BEFORE PUMPING @ 900ft
735	~63	258.92		5.1	8.03	2090	NA	30.4	
810	63	261.58		0	7.94	2421	22.38	14.5	
850	63	263.21		0	7.83	2464	23.48	9.54	
920	63	263.9		0	7.82	2468	23.75	10.2	
1000	63	264.5		0	7.83	2476	24.18	8.45	
1045	63	265.4		0	7.85	2476	24.21	8.35	
1200	63	266.26		0	7.83	2474	24.33	10.5	
1205									PUMP OFF
2/25 715	0	216.0							PUMP ON
720	63	8254.1		2.1	7.92	2236	21.32	242	
750	63	255.8		>0.1	7.79	2457	23.64	17.8	
830	63	257.3		0	7.80	2463	24.14	16.2	
855	63	~~257.1~~ 258.2		0	7.80	2471	24.28	11.2	
950	63	259.2		0	7.84	2470	24.36	10.4	
1020	63	260.1		0	7.82	2489	24.52	7.99	
1025	0								PUMP OFF
1125 ~~1135~~	0	220.8							START PUMP
1130 ~~1135~~	63	256.7		0.1	7.78	2475	24.46	20.4	
1145	63	258.3		>0.1	7.82	2489	24.56	9.95	
1205	63	259.1		>0.1	7.85	2481	24.59	7.23	
1210	0								PUMP OFF
1255	0	221.2							PUMP ON
1300	63	257.0		>0.1	7.79	24.68	24.66	12.1	
1340	63	249.4		0	7.82	24.83	24.80	7.51	PUMP OFF
1415 ~~1345~~	0	221.9							START PUMP
1420 ~~1350~~	63	257.5		>0.1	7.82	2457	23.71	10.3	
1445	63	258.5		>0.1	7.83	2483	24.43	7.15	PUMP OFF

Comments:
2/25/18 1420 END PUMP DEVELOPMENT @ 900 FT

HALEY ALDRICH

DEVELOPMENT
FIELD DATA LOG

Project Name: FG	Project No.: 129667
Well No.: R-05	Date: 2-25-18
Location:	Measuring Point: GROUND SURFACE
Total Depth of Well (ft bls): 1208	Screen Interval (ft bls):
Pump Type/Setting (ft bls): 6000	Activity: PUMP DEVELOPMENT
How Q Measured: TRAILER	H&A Personnel: C. GIUSTI

Time	Discharge (gpm)	Pumping Water Level (ft)	Specific Capacity (gpm/ft)	Sand Content (ppm)	pH	Sp. Cond. (µmhos/cm)	Temp. °C	Turbidity NTU	Comments
1625	0	220.5							PUMP @ 6000'
1625	63	258.8		>0.1	7.74	2586	23.75	15.0	PUMP ON
1655 ~~1655~~	63	257.6		0	7.83	2477	24.13	7.55	
1745	63	262.5		0	7.83	2468	24.08	5.64	PUMP OFF FOR DAY
2/26-18 700	0	221.3							
705	63	254.0		>0.1	7.44	2331	21.05	25.5	
720	63	254.6		>0.1	7.80	2444	23.7	25.3	
750	63	257.8		>0.1	7.79	2425	23.29	8.95	
800	63	258.2		>0.1	7.77	2441	23.58	6.07	PUMP OFF
835	0	220.8							PUMP ~~OFF~~ ON
845	63	255.8		>0.1	7.78	2448	23.44	19.9	
900	63	257.6		>0.1	7.74	2460	24.21	8.21	
915	63	258.2		>0.1	7.74	2465	24.17	9.90	PUMP OFF 7.65 NTU
955	0	221.4							PUMP ON
1000			PUMP OFF		HOSE RUPTURED				
1005	63								PUMP ON
1010	63	257.0		>0.1	7.77	2466	24.47	7.05	
1025	63	257.9		>0.1	7.74	2475	24.60	8.34	PUMP OFF
1100	0	222.6							PUMP ON
1110	63	257.2		>0.1	7.74	2481	24.59	7.07	
1125	63	258.0		>0.1	7.78	2495	24.70	5.80	PUMP OFF
									END DEVELOPMENT

Comments:

HALEY ALDRICH

APPENDIX I

Well Video Log and Gyroscopic Survey Reports

Southwest Exploration Services, LLC
borehole geophysics & video services

Southwest Exploration Services, LLC

25811 S. Arizona Avenue Chandler, AZ. 85248

Phone: (480) 926-4558 Fax: (480) 926-4579 Web: www.swexp.com

Client: Florence Copper | Survey Date: March 21, 2018

Address: 1575 West Hunt Hwy | Invoice: | Run: 1

City: Florence | State: AZ | Zip: 85132 | **Well Name:** R-05

Requested By: | P.O.: | **Well Owner:** Florence Copper

Copy To: H&A | Camera: CCV S.S. Color Camera - Ring of Lights

Purpose: General Inspection | Zero Datum: Top of Casing

Location: | Depth: 1200 ft. | Vehicle: 290

Field: Florence Copper Project | Type Perfs: Horizontal Slots

1st Csg.O.D. 5 In. | Csg Weight: | From: 0 ft. | To: 1192 ft. | 2nd Csg.O.D. | Csg Weight: | From: | To:

Standing Water Level: 230.07 ft. | Pumping Water Level: | Pump Depth: | O.D.Ref.: Measured | Casing Buildup: None

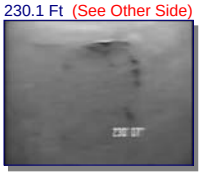
Operator: D. Beam | Lat.: | Long.: | Sec: | Twp: | Rge:

Other Information:

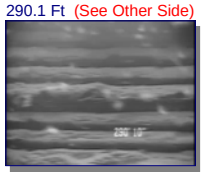
Wellbore Snapshots

0 Ft (See Other Side)

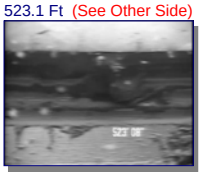
230.1 Ft (See Other Side)



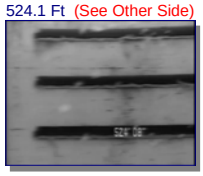
290.1 Ft (See Other Side)



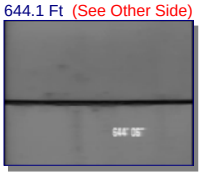
523.1 Ft (See Other Side)



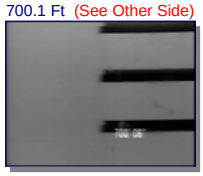
524.1 Ft (See Other Side)



644.1 Ft (See Other Side)

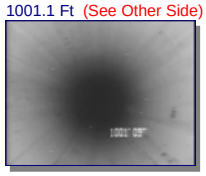


700.1 Ft (See Other Side)

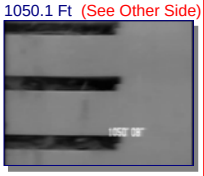


850.1 Ft (See Other Side)

1001.1 Ft (See Other Side)



1050.1 Ft (See Other Side)



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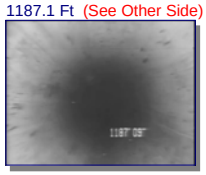
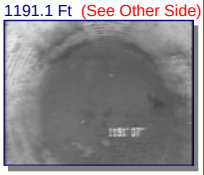


1191.1 Ft (See Other Side)



True Depths: (SideScan-Feet)	WELLBORE / CASING INFORMATION
0.	Survey started at the top of the casing.
230.1	Static water level observed.
290.1	Seem just below water level.
523.1	Transition piece observed.
524.1	First perforations observed.
644.1	Blank section started.
700.1	Clean perforations.
850.1	Clean perforations.
1,001.1	Down view of perforations.
1,050.1	Clean perforations.
1,187.1	Down view just above the bottom of the casing.
1,191.1	Bottom of the case observed, survey ended.

Notes:

Page Number: 1

12 WELLBORE SHAPSHOTS

0 Ft (Enlargement)

230.1 Ft (Enlargement)

290.1 Ft (Enlargement)

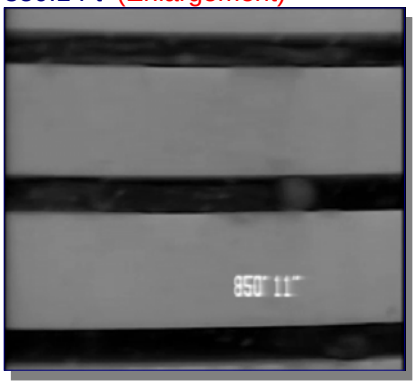
523.1 Ft (Enlargement)

524.1 Ft (Enlargement)

644.1 Ft (Enlargement)

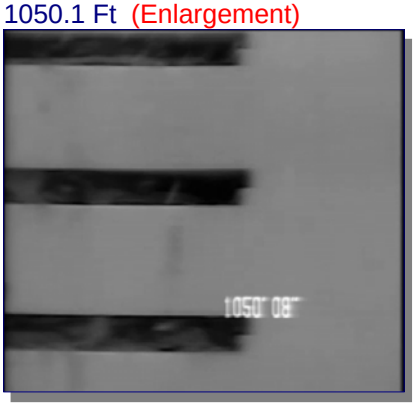
700.1 Ft (Enlargement)

850.1 Ft (Enlargement)

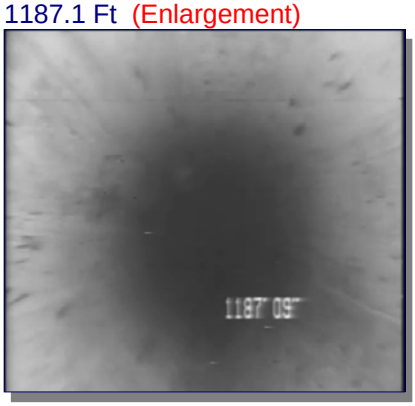


1001.1 Ft (Enlargement)

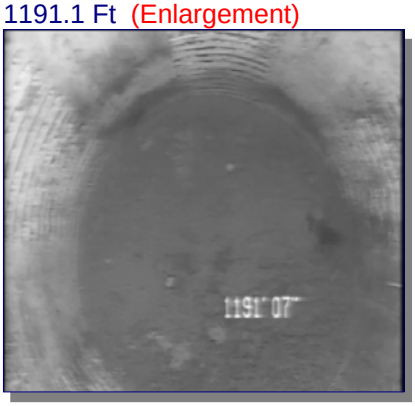
1050.1 Ft (Enlargement)



1187.1 Ft (Enlargement)



1191.1 Ft (Enlargement)



Drift Report

Wellbore DRIFT Interpretation

PREPARED ESPECIALLY FOR

Florence Copper and Florence Copper

R-05

Wednesday - March 21, 2018

Southwest Exploration Services, LLC
borehole geophysics and video services

This Wellbore Interpretation Package represents our best efforts to provide a correct interpretation. Nevertheless, since all interpretations are opinions based on inferences from electrical or other types of measurements, we cannot and do not guarantee the accuracy or correctness of any interpretation, and we shall not be liable or responsible for any loss, costs, damages, or expenses incurred or sustained by Customer resulting from any interpretation made by this document. We do not warrant or guarantee the accuracy of the data, specifically including (but without limitations) the accuracy of data transmitted by electronic process, and we will not be responsible for accidental or intentional interception of such data by third parties. Our employees are not empowered to change or otherwise modify the attached interpretation. Furthermore, along with Eagle Pro Software we do not warrant or guarantee the accuracy of the programming techniques employed to produce this document. By accepting this Interpretation Package, the Customer agrees to the foregoing, and to our General Terms and Conditions.

Southwest Exploration Services, LLC
(480) 926-4558

WELLBORE DRIFT INTERPRETATION

Southwest Exploration Services, LLC
(480) 926-4558

Company: Florence Copper **Well Owner:** Florence Copper

County: Pinal **State:** Arizona **Country:** United States

Well Number: R-05 **Survey Date:** Wednesday - March 21, 2018 **Magnetic Declination:** Declination Correction Not Used

Field: Florence Copper Project **Drift Calculation Methodology:** Balanced Tangential Method

Location:

Remarks:

Witness: H&A **Vehicle No.:** 800 **Invoice No.:** **Operator:** K. MITCHELL **Well Depth:** 1220 Feet **Casing size:** 5 Inches

Tool: Gyro - 1422 **Lat.:** **Long.:** **Sec.:** **Twp.:** **Rge.:**

MEASURED DATA			DATA COMPUTATIONS						
DEPTHS, feet	INCLINATIONS, degrees	AZIMUTHS, degrees	TVD, feet	T. LATITUDE, feet	T. LONGITUDE, feet	DOGLEG SEV., degrees per 20 Feet	DOGLEG SEV., degrees per 100 feet	DRIFT DIST., feet	DRIFT BGR., degrees
0	0.48	106.13	0.00						
20	0.35	148.33	19.99	-0.075	0.113	1.00	2.79	0.14' (1.68")	123.80
40	0.28	184.66	39.98	-0.176	0.141	0.41	2.41	0.23' (2.76")	141.20
60	0.32	170.62	59.97	-0.280	0.146	0.96	0.95	0.32' (3.84")	152.40
80	0.32	173.79	79.96	-0.391	0.161	0.84	0.21	0.42' (5.04")	157.60
100	0.37	175.16	99.96	-0.511	0.172	0.42	0.09	0.54' (6.48")	161.30
120	0.35	176.12	119.95	-0.636	0.182	0.13	0.06	0.66' (7.92")	164.10
140	0.43	187.22	139.94	-0.771	0.177	0.43	0.75	0.79' (9.48")	167.10
160	0.35	195.39	159.93	-0.904	0.151	0.83	0.55	0.92' (11.04")	170.50
180	0.37	202.77	179.92	-1.022	0.110	0.95	0.50	1.03' (12.36")	173.90
200	0.34	222.84	199.91	-1.125	0.045	0.37	1.35	1.13' (13.56")	177.70
220	0.30	228.09	219.90	-1.203	-0.034	1.00	0.35	1.20' (14.40")	181.60
240	0.31	253.54	239.89	-1.253	-0.125	1.00	1.71	1.26' (15.12")	185.70
260	0.23	294.64	259.88	-1.252	-0.213	0.34	2.72	1.27' (15.24")	189.70
280	0.12	352.45	279.87	-1.215	-0.252	0.93	3.74	1.24' (14.88")	191.70
300	0.08	058.82	299.86	-1.187	-0.243	0.78	4.24	1.21' (14.52")	191.60
320	0.22	020.85	319.85	-1.144	-0.217	0.53	2.52	1.16' (13.92")	190.80
340	0.15	181.28	339.84	-1.134	-0.204	0.00	7.63	1.15' (13.80")	190.20

True Vertical Depth: 1190.65' **Final Drift Distance:** 7.24' (86.88") **Final Drift Bearing:** 153.60°

Note: Magnetic Declination is not used because it is not a factor in the calculation of well drift or alignment. Magnetic Declination is only important if attempting to hit a target or miss another well and then it is included in the calculations.

WELLBORE DRIFT INTERPRETATION

Southwest Exploration Services, LLC

R-05

(480) 926-4558

MEASURED DATA			DATA COMPUTATIONS						
DEPTHS, feet	INCLINATIONS, degrees	AZIMUTHS, degrees	TVD, feet	T. LATITUDE, feet	T. LONGITUDE, feet	DOGLEG SEV., degrees per 20 Feet	DOGLEG SEV., degrees per 100 feet	DRIFT DIST., feet	DRIFT BRG., degrees
360	0.22°	189.67°	359.83	-1.198	-0.211	0.56	0.57	1.22' (14.64")	190.00
380	0.28°	285.13°	379.82	-1.223	-0.265	0.73	5.73	1.25' (15.00")	192.20
400	0.18°	202.15°	399.81	-1.239	-0.324	0.88	5.13	1.28' (15.36")	194.70
420	0.29°	135.11°	419.80	-1.304	-0.300	0.20	4.28	1.34' (16.08")	193.00
440	0.42°	019.01°	439.79	-1.271	-0.240	0.97	6.57	1.29' (15.48")	190.70
460	0.32°	073.00°	459.78	-1.185	-0.163	0.96	3.51	1.20' (14.40")	187.80
480	0.24°	078.80°	479.77	-1.161	-0.069	0.12	0.39	1.16' (13.92")	183.40
500	0.28°	093.21°	499.76	-1.156	0.021	0.81	0.97	1.16' (13.92")	179.00
520	0.23°	122.48°	519.75	-1.180	0.104	0.59	1.96	1.18' (14.16")	175.00
540	0.36°	097.75°	539.74	-1.210	0.200	0.73	1.66	1.23' (14.76")	170.60
560	0.45°	099.68°	559.73	-1.232	0.340	0.28	0.13	1.28' (15.36")	164.60
580	0.45°	120.54°	579.72	-1.285	0.485	0.77	1.40	1.37' (16.44")	159.30
600	0.49°	132.65°	599.71	-1.383	0.616	0.49	0.82	1.51' (18.12")	156.00
620	0.60°	132.83°	619.70	-1.512	0.756	0.69	0.01	1.69' (20.28")	153.40
640	0.73°	129.40°	639.69	-1.664	0.931	0.13	0.23	1.91' (22.92")	150.80
660	0.53°	156.31°	659.68	-1.830	1.067	0.83	1.80	2.12' (25.44")	149.80
680	0.54°	147.94°	679.67	-1.995	1.154	0.80	0.56	2.30' (27.60")	149.90
700	0.38°	159.74°	699.66	-2.137	1.227	0.25	0.80	2.46' (29.52")	150.10
720	0.45°	123.29°	719.65	-2.242	1.316	0.54	2.42	2.60' (31.20")	149.60
740	0.33°	155.27°	739.64	-2.337	1.406	0.24	2.13	2.73' (32.76")	149.00
760	0.30°	132.14°	759.63	-2.424	1.469	0.94	1.55	2.83' (33.96")	148.80
780	0.54°	168.95°	779.62	-2.552	1.526	0.65	2.44	2.97' (35.64")	149.10
800	0.30°	118.94°	799.61	-2.670	1.590	0.97	3.27	3.11' (37.32")	149.20
820	0.31°	209.32°	819.60	-2.743	1.609	0.06	5.49	3.18' (38.16")	149.60
840	0.41°	109.65°	839.59	-2.814	1.650	0.29	5.92	3.26' (39.12")	149.60
860	0.55°	095.37°	859.58	-2.847	1.813	0.57	0.96	3.38' (40.56")	147.50
880	0.72°	114.23°	879.57	-2.908	2.023	0.47	1.27	3.54' (42.48")	145.20
900	0.78°	153.45°	899.56	-3.081	2.198	0.42	2.60	3.79' (45.48")	144.50
920	0.80°	181.32°	919.55	-3.342	2.256	0.69	1.86	4.03' (48.36")	146.00
940	0.58°	164.64°	939.54	-3.579	2.280	0.04	1.12	4.24' (50.88")	147.50
960	0.73°	183.84°	959.53	-3.804	2.298	0.30	1.29	4.44' (53.28")	148.90
980	0.46°	108.19°	979.52	-3.956	2.366	0.98	4.75	4.61' (55.32")	149.10
1,000	0.85°	182.17°	999.52	-4.129	2.437	0.95	4.66	4.79' (57.48")	149.50

True Vertical Depth: 1190.65' **Final Drift Distance: 7.24' (86.88")** **Final Drift Bearing: 153.60°**

WELLBORE DRIFT INTERPRETATION

Southwest Exploration Services, LLC

R-05

(480) 926-4558

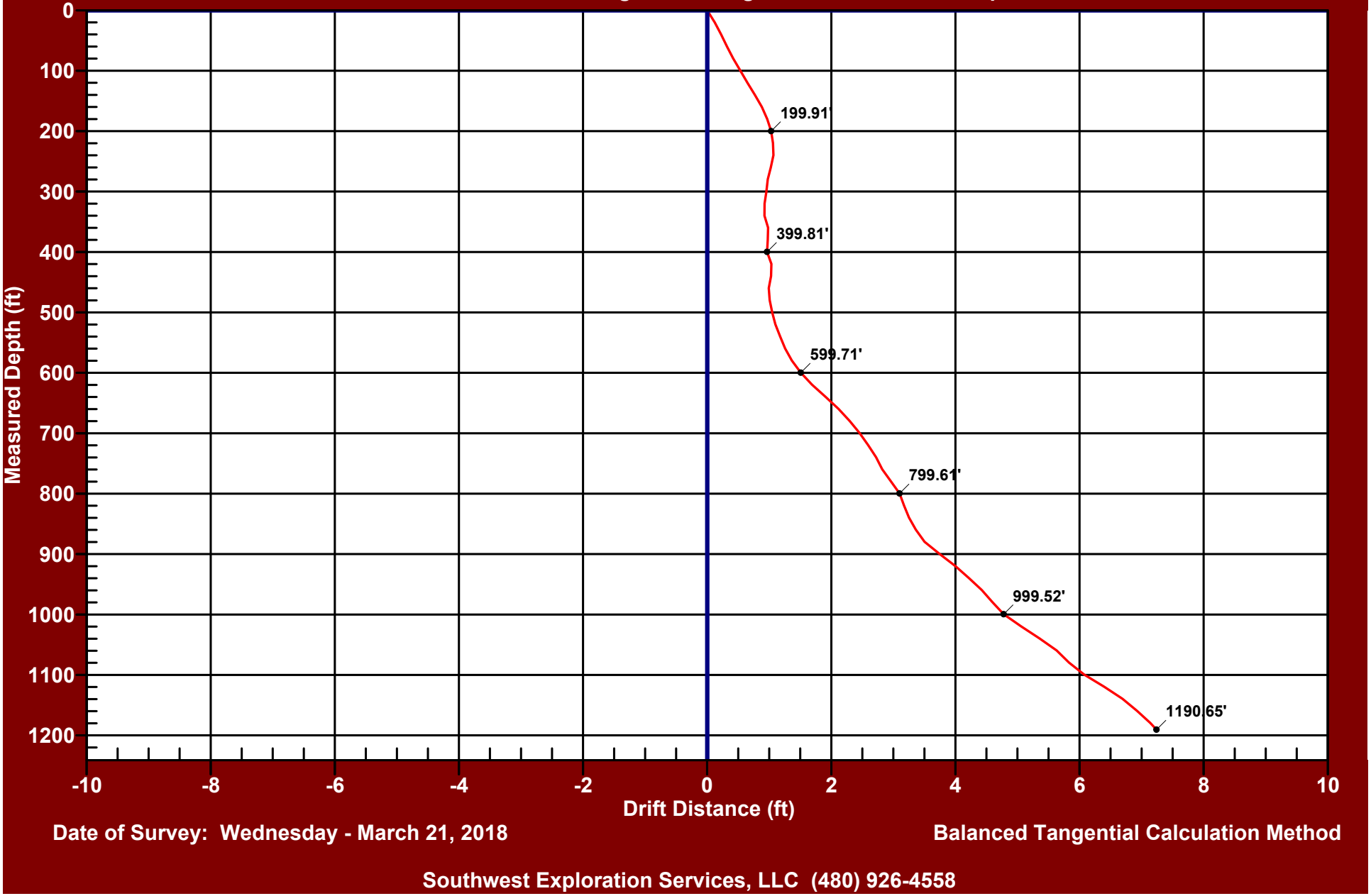
MEASURED DATA			DATA COMPUTATIONS						
DEPTHS, feet	INCLINATIONS, degrees	AZIMUTHS, degrees	TVD, feet	T. LATITUDE, feet	T. LONGITUDE, feet	DOGLEG SEV., degrees per 20 Feet	DOGLEG SEV., degrees per 100 feet	DRIFT DIST., feet	DRIFT BRG., degrees
1,020	1.00°	119.44°	1,019.51	-4.363	2.583	0.96	4.03	5.07' (60.84")	149.40
1,040	0.94°	170.84°	1,039.50	-4.611	2.761	0.46	3.36	5.37' (64.44")	149.10
1,060	0.70°	175.98°	1,059.49	-4.895	2.796	0.25	0.35	5.64' (67.68")	150.30
1,080	0.65°	119.30°	1,079.48	-5.072	2.903	0.92	3.68	5.84' (70.08")	150.20
1,100	0.87°	146.12°	1,099.47	-5.254	3.087	0.09	1.80	6.09' (73.08")	149.60
1,120	0.97°	165.12°	1,119.46	-5.544	3.215	0.16	1.28	6.41' (76.92")	149.90
1,140	0.75°	170.69°	1,139.45	-5.837	3.280	0.98	0.38	6.70' (80.40")	150.70
1,160	0.71°	179.26°	1,159.44	-6.090	3.303	0.54	0.58	6.93' (83.16")	151.50
1,180	0.74°	192.33°	1,179.43	-6.340	3.277	0.80	0.88	7.14' (85.68")	152.70
1,191	0.81°	210.44°	1,190.65	-6.479	3.221	0.21	2.17	7.24' (86.88")	153.60

True Vertical Depth: 1190.65' **Final Drift Distance: 7.24' (86.88")** **Final Drift Bearing: 153.60°**

PLANE OF DRIFT VIEW - R-05

Florence Copper
Florence Copper

Drift Distance = 7.24 Feet Drift Bearing = 153.6 Degrees True Vertical Depth = 1190.65 Feet



Date of Survey: Wednesday - March 21, 2018

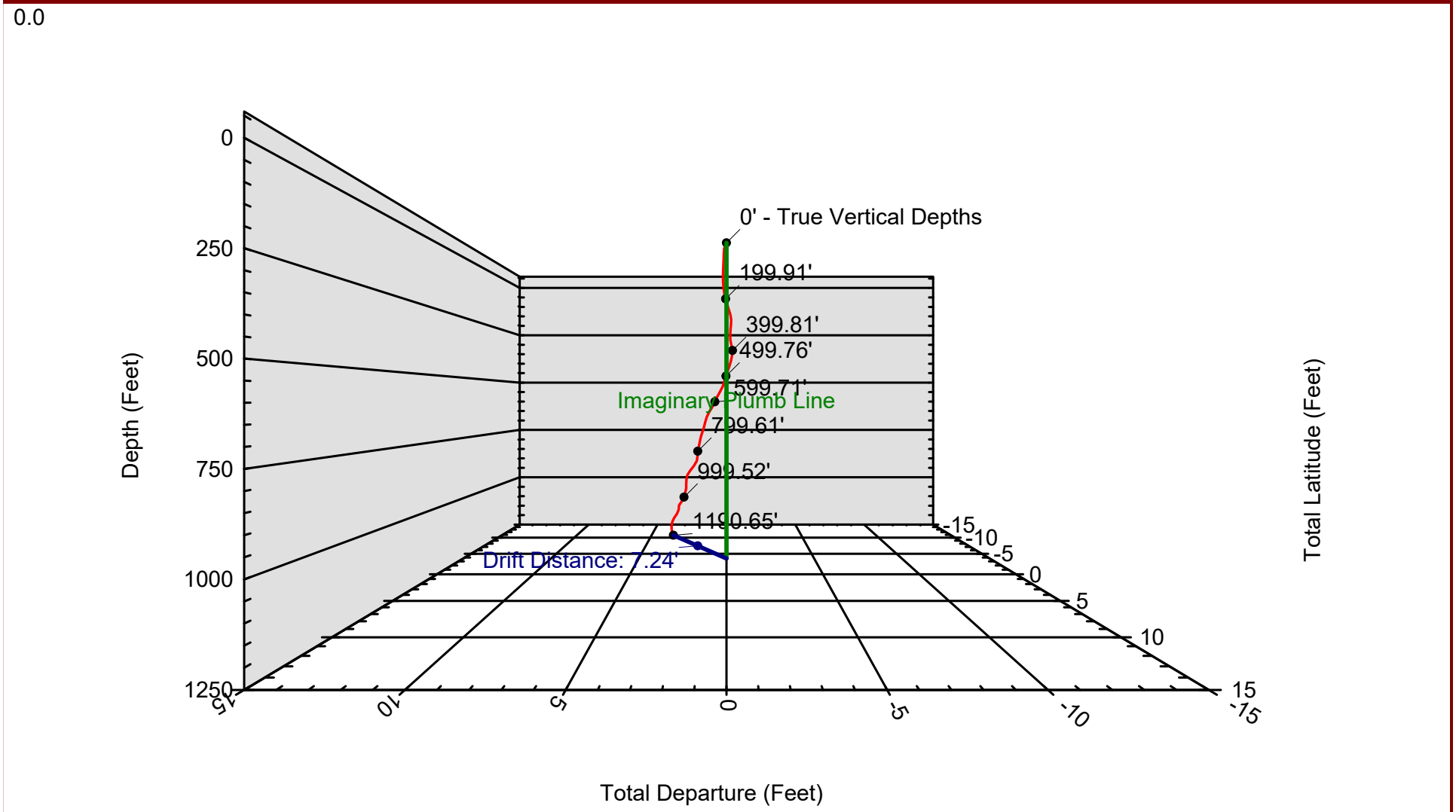
Balanced Tangential Calculation Method

Southwest Exploration Services, LLC (480) 926-4558

3D PROJECTION VIEW - R-05

Florence Copper
Florence Copper

Drift Distance = 7.24 Feet **Drift Bearing = 153.6 Degrees** **True Vertical Depth = 1190.65 Feet**



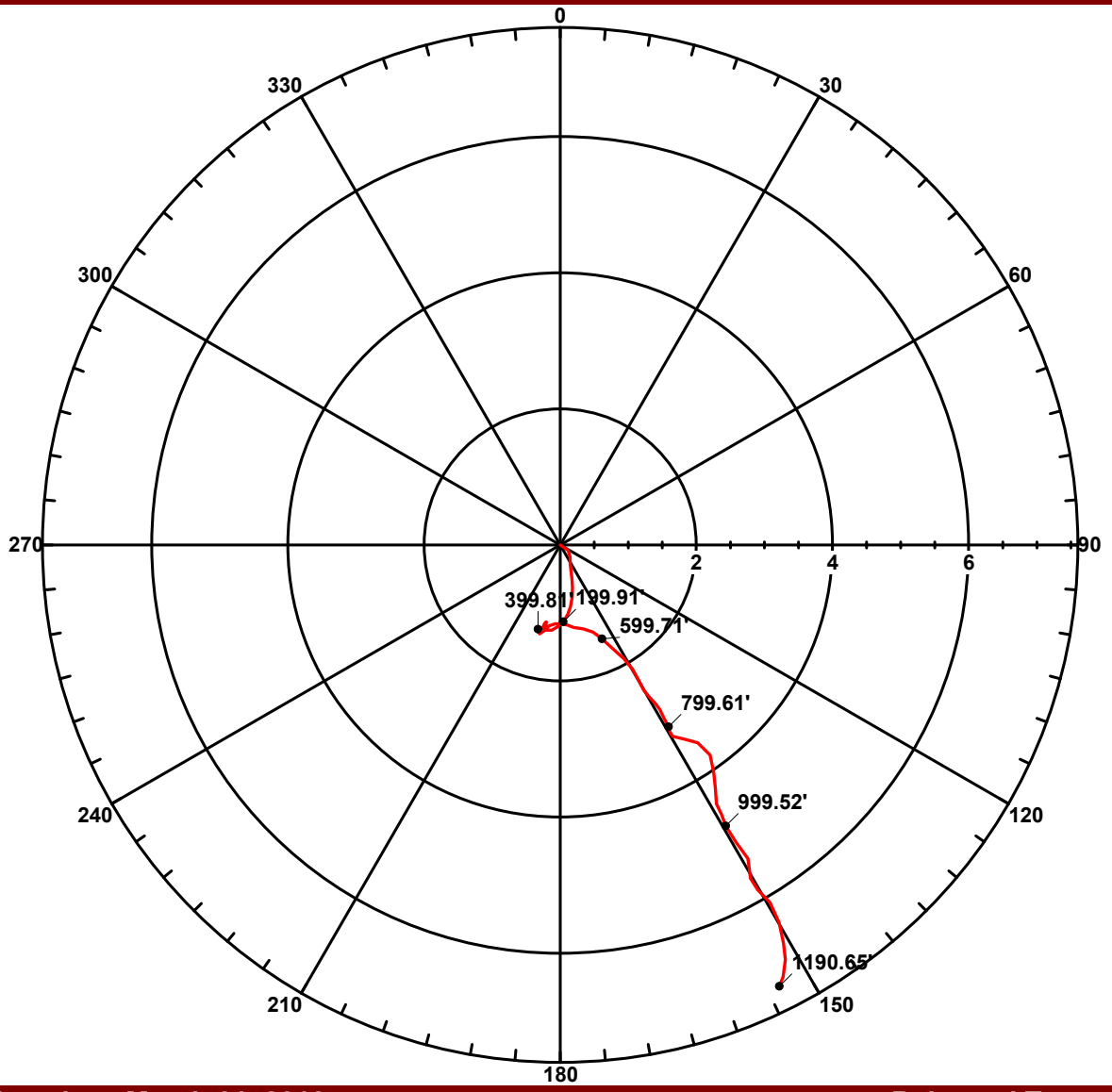
Date of Survey: Wednesday - March 21, 2018 **Balanced Tangential Calculation Method**

Southwest Exploration Services, LLC (480) 926-4558

POLAR VIEW - R-05

Florence Copper
Florence Copper

Drift Distance = 7.24 Feet Drift Bearing = 153.6 Degrees True Vertical Depth = 1190.65 Feet



Date of Survey: Wednesday - March 21, 2018 **Balanced Tangential Calculation Method**

Southwest Exploration Services, LLC (480) 926-4558

EASTING RECTANGULAR VIEW - R-05

Florence Copper
Florence Copper

Drift Distance = 7.24 Feet Drift Bearing = 153.6 Degrees True Vertical Depth = 1190.65 Feet

Date of Survey: Wednesday - March 21, 2018

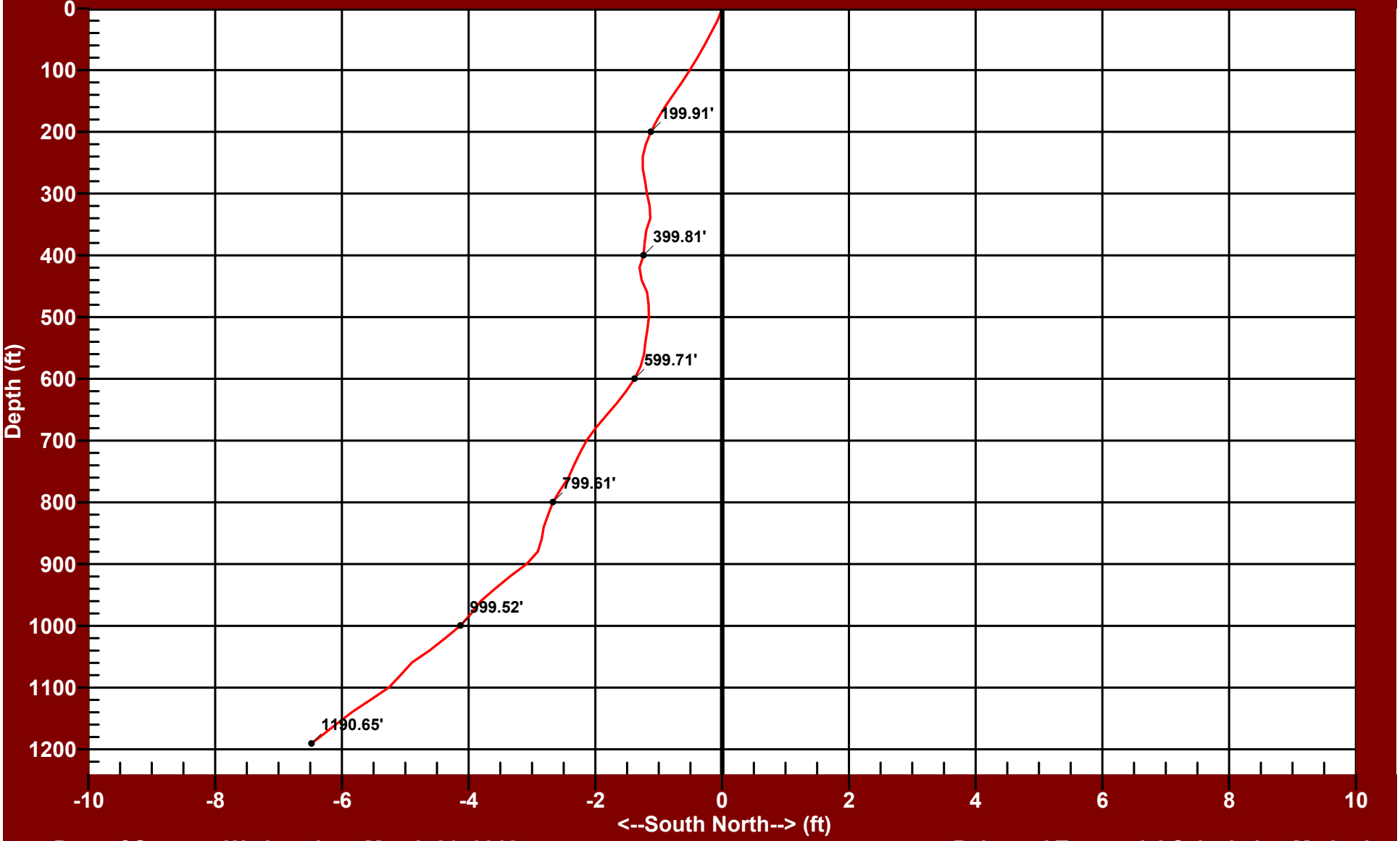
Balanced Tangential Calculation Method

Southwest Exploration Services, LLC (480) 926-4558

NORTHING RECTANGULAR VIEW - R-05

Florence Copper
Florence Copper

Drift Distance = 7.24 Feet Drift Bearing = 153.6 Degrees True Vertical Depth = 1190.65 Feet



Date of Survey: Wednesday - March 21, 2018

Balanced Tangential Calculation Method

Southwest Exploration Services, LLC (480) 926-4558